

Schwab goes for broke with object manager

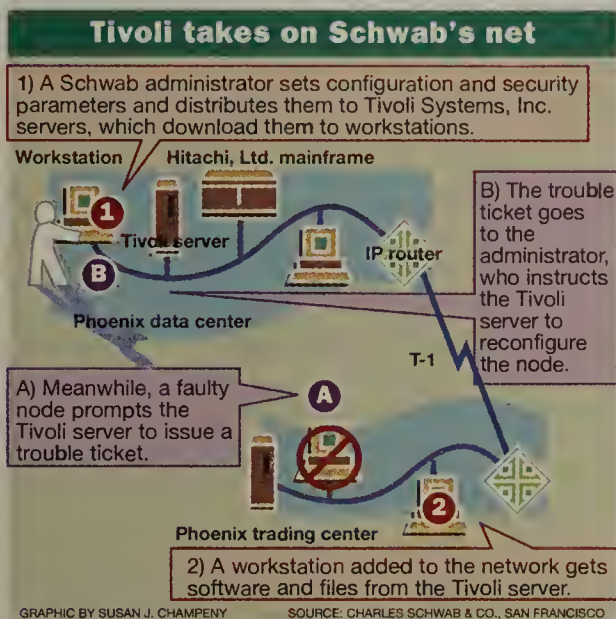
BY JIM DUFFY

Phoenix

Discount stockbroker Charles Schwab & Company, Inc. is investing in object-oriented management software to govern its burgeoning client/server network, which is based on the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE).

Schwab last week placed a \$2.3 million order with Tivoli Systems, Inc. for the Tivoli Management Environment — distributed management software that will help Schwab control operations at its regional telephone centers and brokerage houses located around the country.

Schwab will use the Tivoli Management Environ-



ment for systems administration activities, such as adding users and workstations to the network, distributing software, as well as establishing and enforcing security policies.

See Schwab, page 8

SynOptics, ODS rock the hub club

BY SKIP MACASKILL

Santa Clara, Calif.

SynOptics Communications, Inc. is expected to show its true Blue colors this week when it unveils hardware and network management offerings aimed at users with big IBM SNA networks.

The company's LattisSystem 3000 intelligent hub will get a 3174 controller module that supports Advanced Peer-to-Peer Networking (APPN) and will tie local-area networks more tightly into the Systems Network Architecture world. SynOptics will also offer up a new version of its Optivity for NetView/6000 net management package that gives users much more flexibility in configuring token rings.

The new products are part of SynOptics' effort to bolster SNA connectivity and management offerings in light of the investment being made in those areas by rivals Cabletron Systems, Inc. and Chipcom Corp.

Chipcom, which sealed a far-reaching technology partnership with IBM in July 1992, recently rolled out a 3174 controller module for its ONline System Concentrator that was codeveloped by IBM and is similar to the SynOptics module.

Cabletron currently offers Syn-

See SynOptics, page 69

BY SKIP MACASKILL

Richardson, Texas

Optical Data Systems, Inc. (ODS) next week is expected to roll out two modules for its Infinity intelligent hub that strengthen its position against other high-end offerings.

ODS will unveil a Simple Network Management Protocol-based module that offers per-port traffic analysis and an Ethernet module that aids in network segmentation by allowing ports to be assigned to any of the Infinity's four Ethernet backplanes.

The new features will help the Infinity compete more effectively against high-end hubs such as SynOptics Communications, Inc.'s LattisSystem 5000, which is designed as an anchor for collapsed backbone environments (NW, Sept. 13, page 1).

"If a company wants to transition its departmental or work group hub to an enterprise device, RMON and the ability to reconfigure the network via software are essential," said Jennifer Pigg, program manager at The Yankee Group, a Boston-based consultancy.

The new SNMP Interface Module, which can be used to monitor both Ethernet and token-ring local-area networks, comes equipped with a Reduced Instruction Set Computing-

See ODS, page 68

CLIENT/SERVER

Microsoft redirects NT-to-NetWare link

BY CHRISTINE BURNS

Washington, D.C.

Microsoft Corp. officials last week detailed plans for enhanced redirector software that will give Windows NT workstations access to more than just file and print services on NetWare LANs.

Within two weeks,

Microsoft will release new beta redirector software that turns a Windows NT Advanced Server (NTAS) machine into a gateway connecting local and remote NT clients to NetWare file and print services, utilities and applications. In September, Microsoft re-

leased its first beta, which only gives NT clients access to Novell, Inc. NetWare file and print services.

Plans for the software were revealed at an NT developers' conference held in conjunction with the FedUnix/Open Systems World trade show here last week. Margaret Johnson, program manager for NT, said the enhanced redirector will be included in the next release of NT.

The new version of NT, code-named Daytona, is set to be released during the first half of next year. Johnson said Daytona is

See Redirects, page 69

IBM secures distributed nets

BY MICHAEL COONEY

Research Triangle Park, N.C.

IBM last week announced its first security program designed to protect users and applications on multivendor enterprise networks.

The Network Security Program (NetSP) 1.1 guards against security infringements by authenticating the identity of users and controlling access to multiple applications across a network using a single logon.

"NetSP will help companies protect sensitive, proprietary information across the enterprise," said Vijay Ahuja, product manager for IBM's network security products.

See IBM, page 69

Time for application servers

November 1990	OS/2 1.3, the first viable version of OS/2, ships.
March 1992	OS/2 2.0 ships.
December 1992	UnixWare 1.0 ships.
May 1993	OS/2 2.1 ships.
August 1993	Windows NT ships.
September 1993	Windows NT Advanced Server ships.
December 1993	Next version of UnixWare to ship.

GRAPHIC BY TERRI MITCHELL

Giants grapple in app server fight

BY CHRISTINE BURNS AND CARYN GILLOOLY

IBM, Microsoft Corp. and Novell, Inc. are duking it out over which offers the best application server platform, but the matchup has raised questions over whether OS/2, Windows NT and UnixWare even belong in the same weight class.

While Microsoft and Novell have touted the merits of their respective candidates, analysts and users agree that the 32-bit, multitasking OS/2 has quietly come into its own as an application server.

Novell argues that UnixWare serves up the power of a Unix-based operating system in a simplified package that runs on an Intel Corp. box. Unix has traditionally been the only operating system with enough power to handle high-end applications, and, according to Novell, UnixWare offers a cost-effective way to run down-sized applications on the local-area network.

Windows NT Advanced Server (NTAS), meanwhile, runs on both Intel and Reduced Instruction Set Computing (RISC)-based machines. With its multiproces-

See Server, page 70

BANG!



Brady handgun bill poses network challenge for states. Page 8.

Briefs

Lockheed to manage 800 database. Lockheed Information Management Services Co. last week assumed responsibility for the 800 Number Administration Center, the 800-portability database now maintained at its Teaneck, N.J., headquarters. Bell Communications Research developed and previously operated the 800 customer record database.

Sun to shine on NetLabs. SunConnect will announce this week that it is licensing NetLabs, Inc.'s DiMONS 3G network and system management platform. The arrangement, which was expected, is a prelude to a distributed, object-oriented management platform from SunConnect based on NetLabs technology (NW, Nov. 15, page 1). The new platform, code-named Encompass, is expected to be released in late 1994 or early 1995.

Before then, SunConnect is expected to roll out two products, called Cooperative Consoles and Cooperative Reporting. These products, expected in the second quarter of next year, are intended to better integrate topology and event information between SunNet Manager platforms and their respective applications and element managers.



Start-up Collabra launched. Former cc:Mail official Eric Hahn this week will announce the formation of a new company to develop messaging-based groupware applications. Hahn will serve as president and chief executive officer of Collabra Software, Inc., based in Mountain View, Calif. The company's first product, to be launched in the first quarter of next year, will be based on Lotus Development Corp.'s Notes product and its underlying electronic mail delivery system. Company officials declined to release other product details.

Time to fess up. Last week, the Federal Communications Commission released an order requiring alternate local access providers to report network outages to the commission, just as the regional Bell holding companies do. The FCC also proposed, among other things, that all carriers should be required to report to the commission within 120 minutes any outages lasting 30 minutes or more and potentially affecting 50,000 customers.

BellSouth calls AT&T/McCaw merger illegal. BellSouth Corp. last week asked the U.S. District Court in Washington, D.C. to block the AT&T and McCaw Communications, Inc. merger on the grounds it violates the Modified Final Judgment rule that prevents AT&T from acquiring Bell company stock or assets. McCaw owns several cellular-spectrum properties in partnership with BellSouth and other Bell companies. AT&T officials said BellSouth's claims have no merit.

Cable network news. Canadian telecommunications carrier BCE, Inc. last week said it has agreed to pay \$400 million for 30% of Jones Intercable, Inc. in a deal that could eventually result in BCE buying all of the large Englewood, Colo., cable television operator.

MCI gets backhoe blues. MCI took a hit Friday morning when a construction crew near Milan, Mich., accidentally sliced the carrier's main Detroit spur. The 11:30 a.m. cut affected more than 23 T-3 links, leaving thousands unable to complete voice and data calls. MCI responded by rerouting calls and deploying a crew to splice the severed lines. By mid-afternoon, the carrier was predicting service would be restored no later than 6 p.m.

Contacts

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Network **HELP** desk

Network World tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.

Can you tell me where I can get Novell, Inc.'s NETX.EXE for DOS 6.0 for our NetWare 2.11 network? I recently installed DOS 6.0 on my personal computer but our network administrator has not upgraded the Novell drivers from DOS 5.0.

Mike Bourke, Houston

Ronald Nutter, escalation manager of 900 Support, a 24-hour, seven-day-per-week NetWare technical support company in Lake Oswego, Ore., replies:

You can download the NETX.EXE files for DOS 6.0 from the NOVFILES area on CompuServe. After getting the new NETX.EXE you will have to issue the following command at the workstation: SETVER NETX.EXE/D and press enter.

Next, reboot the workstation. NETX.EXE should correctly report DOS 6.0 as the version of DOS that it is running on.

How do I evaluate cost and performance of electronic mail for an installation of 4,000 users? Is there any way to measure the actual cost to serve each E-mail client?
Bruce Block, Huntsville, Ala.

John Rizzi, strategic marketing vice president at ON Technology Corp., an E-mail and group scheduling developer in Cambridge, Mass., and president of the MHS Alliance responds:

Several E-mail cost studies have been conducted, both internally by large corporations, and externally by analyst and consultant groups such as Creative Networks, Inc. and Ferris Networks.

These studies examined the cost categories of purchase price, installation, maintenance, network infrastructure, gateways, user training, administrator training and operational costs, and concluded that the average cost per E-mail

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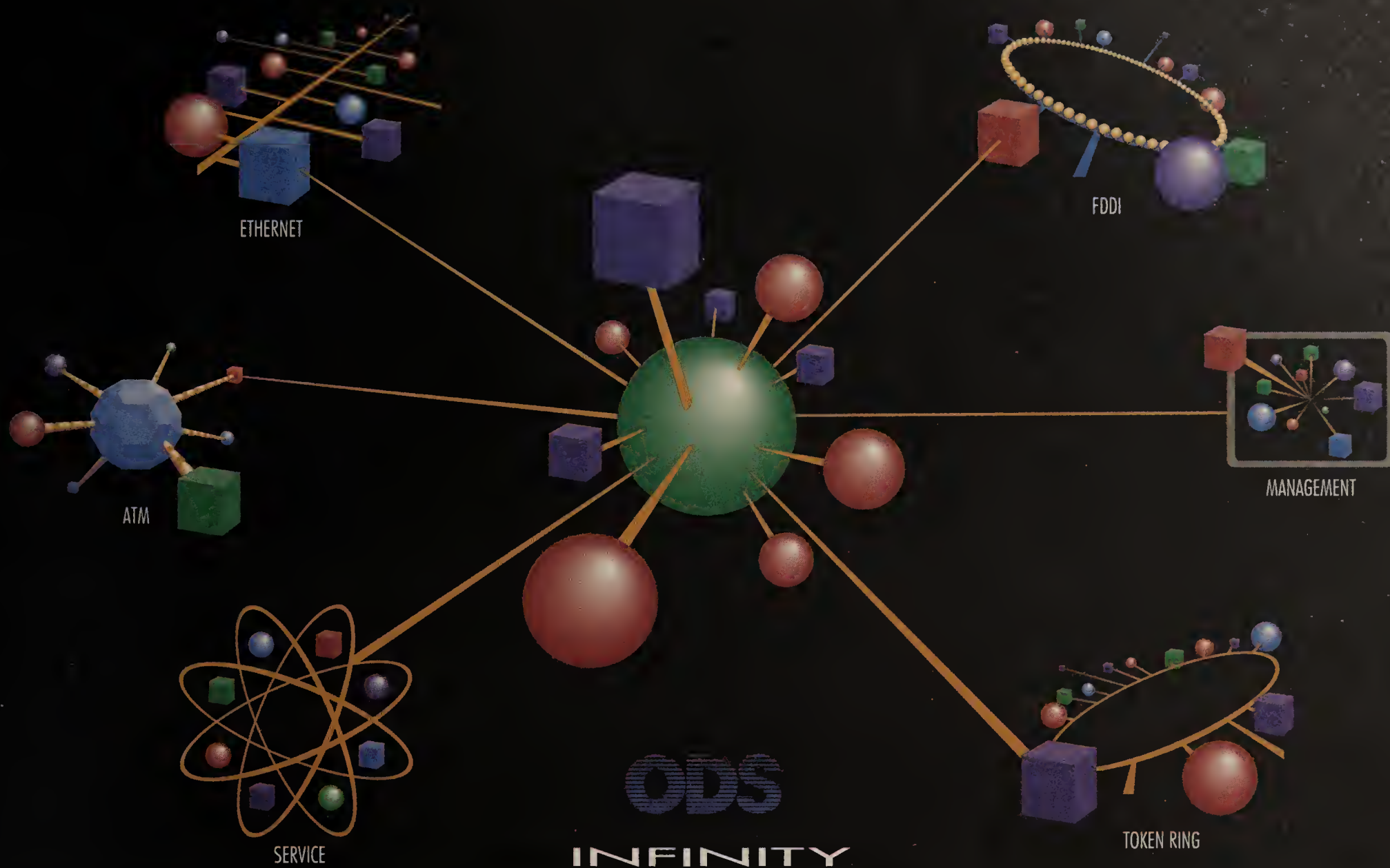
Columnist Richard Finkelstein argues both sides of the coin for using IBM's Distributed Relational Database Architecture. Page 44.

It's no apparition. Buyer's Guide finds imaging systems are being moved off proprietary platforms to a more open computing environment. Page 47.

The Short List

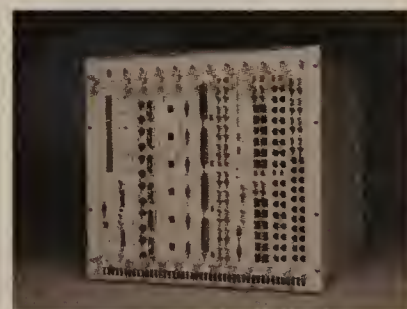
- ✓ Compulink Management Center, Inc.'s LaserFiche Windows/NLM
- ✓ Recognition International, Inc.'s Plexus Extended Data Processing/Plexus FloWare
- ✓ Simplify Development Corp.'s MailRoom for Windows/ShareScan

Complete details about The Short List appear on page 57.



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Motorola asserts patent claims on CDPD service

Action prompts questions concerning the openness of wireless data technology.

BY ELLEN MESSMER

Washington, D.C.

Claiming that the Cellular Digital Packet Data (CDPD) specification infringes on its wireless data patents, Motorola, Inc. last week told radio equipment vendors they will have to license Motorola technology in order to make CDPD gear.

Motorola's claim left several CDPD equipment manufacturers scrambling to examine the patents, saying legal entanglements could delay shipment plans and raise equipment costs if the claims prove valid.

CDPD is a technology that cellular carriers are planning to use to deploy a nationwide, 19.2K bit/sec wireless packet-data network next year.

"In developing an open specification, you try to avoid this," said Mike Lubin, vice president of Pacific Communication Sciences, Inc. (PCSI), which makes base stations, routers and modems for use on CDPD nets. "We have to study Motorola's claims seriously and our own implementation of them."

This month, PCSI plans to ship its Ubiquity 1000 internal modem for the IBM ThinkPad, to be used in CDPD pilots such as the Insurance Value-Added Network Services organization's test with McCaw Cellular Communications, Inc. (NW, Nov. 22, page 1). The PCSI Ubiquity 2000 external CDPD modem, which will work with any personal computer, is scheduled to ship in the first quarter.

According to Mil Ovan, director of business development for CDPD at Motorola's wireless data group, Motorola holds 10 patents that pertain to CDPD. Four of these, such as subscriber device roaming hand off, are essential to building CDPD base stations, modems and end-user devices (see graphic, this page). "We have several others in process that may affect it, too," Ovan added.

"We don't want to be obstructionists," he said. "We're ready to license this technology on a fair and nondiscriminatory basis." He added Motorola

didn't intend to stop manufacturers from building products, but expected suppliers to start negotiations.

Motorola is one of four vendors making CDPD base stations; the others are Hughes Network Systems, Inc., Steinbrecher, Inc. and PCSI.

Last month, Motorola announced its plans for a wide range of CDPD modems during the next two years.

Motorola patent spat

Patents owned by Motorola that it claims cover technology essential to base stations, routers and modems based on Cellular Digital Packet Data, a wireless data technology specification backed by a consortium of carriers and equipment vendors:

- Mobile message routing control
- Definition of a packet-switched cellular network
- Method of subscriber device roaming hand-off
- Radio frequency data blocking structure

SOURCE: MOTOROLA, INC., SCHAUMBURG, ILL.

But other suppliers that Motorola put on notice last week were less sanguine, saying the patent assertions have caught them off-guard.

"The goal of the CDPD consortium was to create an open-air standard so data transfer could be effective and to lower the cost of mobile equipment," said Greg Blair, vice president at Cincinnati Microwave, Inc., which plans to ship a CDPD modem in the first quarter. "We're looking for a response [to Motorola's claims] from the consortium that issued the CDPD spec."

However, it is unclear what action the CDPD consortium will take, if any. The CDPD group includes Ameritech Cellular, Bell Atlantic Corp., Contel Cellular, Inc., GTE MobilNet, Inc., McCaw, Nynex Mobile Communications, PacTel Cellular and Southwestern Bell Mobile Systems.

Motorola said it notified the CDPD consortium last spring that the CDPD specification under development might infringe on Motorola patents. Jeff Brown, McCaw vice president of sales and marketing, said the consortium received notice from Motorola but the group has not formally reviewed Motorola's claims.

"Without any specifics, we don't want to lend any credence to anything Motorola says," Brown said. "Frankly, whether all these patents apply hasn't been determined yet."

POSITIVE EFFECTS

Lubin noted that the positive side of Motorola's patent assertions is that by agreeing to license relevant patents on a nondiscriminatory basis, Motorola does not appear to be acting to impede the development of the CDPD industry.

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Other types of patents that apply to CDPD, such as those for public-key encryption technology held by RSA Data Security, Inc., were fully discussed long ago and were never a point of contention, vendor officials said. ☐

EMERGING SERVICES

Cable companies team against telcos

BY BILL BURCH

Anaheim, Calif.

Responding to telephone company plans to offer video programming, five of the nation's largest cable companies last week banded together to offer advanced telecommunications services over cable nets.

At the Western Cable Show here, Comcast Corp., Continental Cablevision, Inc., Cox Cable Communications, Inc. (TCI) and Time Warner Entertainment said they plan to develop residential and business services for competitive access, data communications, personal communications services, utility monitoring and video telephony.

Product specifics and launch dates have yet to be worked out, but the alliance hopes to pull in a large number of cable operators to compete as alternative service providers against local exchange carriers (LEC). The five companies are forming a joint venture that will set up a national organization to develop advanced services, which local cable companies would sell to users.

The alliance's strongest potential offering may be competitive access since four of its members already owned significant stakes in competitive access provider Teleport Communications Group, Inc. The fifth member, which is Time Warner Communications, a unit of Time Warner Cable, last week announced that it would join its partners by buying 16.67% of Teleport, the same stake as Comcast and Continental. Cox owns 25.05% of the carrier, and TCI owns 24.95%. Terms of the purchase were not disclosed.

In the local loop, the cable companies' advanced services will go head-to-head with LEC telephony services. The LECs are planning to offer many of the same advanced services as the cable companies, such as personal communications services.

Prospects for the cable alliance are uncertain.

The alliance is meant to foster competition against the LECs,

but two of its founders have strong ties

to regional Bell holding companies. Bell Atlantic Corp. is in the process of acquiring TCI, while US West, Inc. holds 25% of Time Warner Entertainment.

Also, the RBHCs dominate entire regions of the country for local telephony service, and many of them have experience with nationwide offerings, such as cellular service or directory publishing. In contrast, the cable companies frequently split service in large metropolitan areas between multiple service providers. For example, Chicago has 12 cable operators that would compete against Ameritech, the primary telecommunications services provider in the area.

The cable alliance is meant to counter that fragmentation by developing national service organizations and to foster the development of wide-area networks. But the cable industry has a history of not delivering on promised new services, according to Leland Johnson, a former Rand Corp. analyst now working independently on a study of competition between the cable and telephone industries.

"So many ventures have been announced and then nothing more is heard," Johnson said. The current announcement is probably more hype than reality but might produce some successes, he said.

A Network World survey this fall found corporate users ambivalent about cable companies' entry into telecommunications services. In a poll of 101 users by

First Market Research of Austin, Texas, only 43% of users said cable television providers have the technology, resources and experience to compete effectively. As to whether the entry of CATV providers into the telecommunications business would benefit their companies, 53% said it would, while 38% said it would not. The rest were undecided. ☐

Consortium eyes new role for cable

The players

- Comcast Corp.
- Continental Cablevision, Inc.
- Cox Cable Communications, Inc.
- Tele-Communications, Inc.
- Time Warner Entertainment

1 1

The services

- Competitive access
- Data communications
- Digital video telephony
- Energy utility communications
- Wireless services, such as personal communications service

1 1

DEC teams with ASU, Times Mirror

Digital Equipment Corp. has teamed with Arizona State University (ASU) and Times Mirror Cable Television to build a CATV-based metropolitan-area Ethernet internet network, which will be tested by a handful of large companies here.

The Transmission Control Protocol/Internet Protocol network will link McDonnell Douglas Helicopter Co. to suppliers Modern Industries Inc. and Tempe Precision Instruments, Inc. The network will allow these companies to electronically exchange purchase orders and concurrently view and edit documents containing text and graphics.

The network will also allow the companies to electronically authorize changes to documents or product specifications, interactively view and revise computer-aided design drawings, and engage in desktop videoconferencing.

DEC is providing its ChannelWorks bridge, designed to link Ethernet local-area networks to CATV cable plants. DEC is also

supplying six Alpha workstations and an Alpha server, and is managing the network using its Polycenter Framework software and applications.

DEC developed the videoconferencing and the interactive document, text and graphics editing application software that will be used in the test.

Times Mirror is supplying the cable television facilities, and ASU developed the graphical user interface for the Alpha workstations and the purchase order application software.

The network will be operated and managed from ASU's campus in Tempe, Ariz.

"What we're trying to get here is an understanding of what applications are really going to be needed" by these companies, said Dave Rosi, DEC director of video and interactive services. "What utility is there for this network? We're really looking to build the business case for how this would be rolled out on a commercial basis."

BY JIM DUFFY

CORRECTION

The phone number for Reach Software Corp. in a recent article was incorrect. The correct number is (408) 733-8685. An incorrect number was also listed for Concord Communications, Inc. The correct number is (508) 460-4646.

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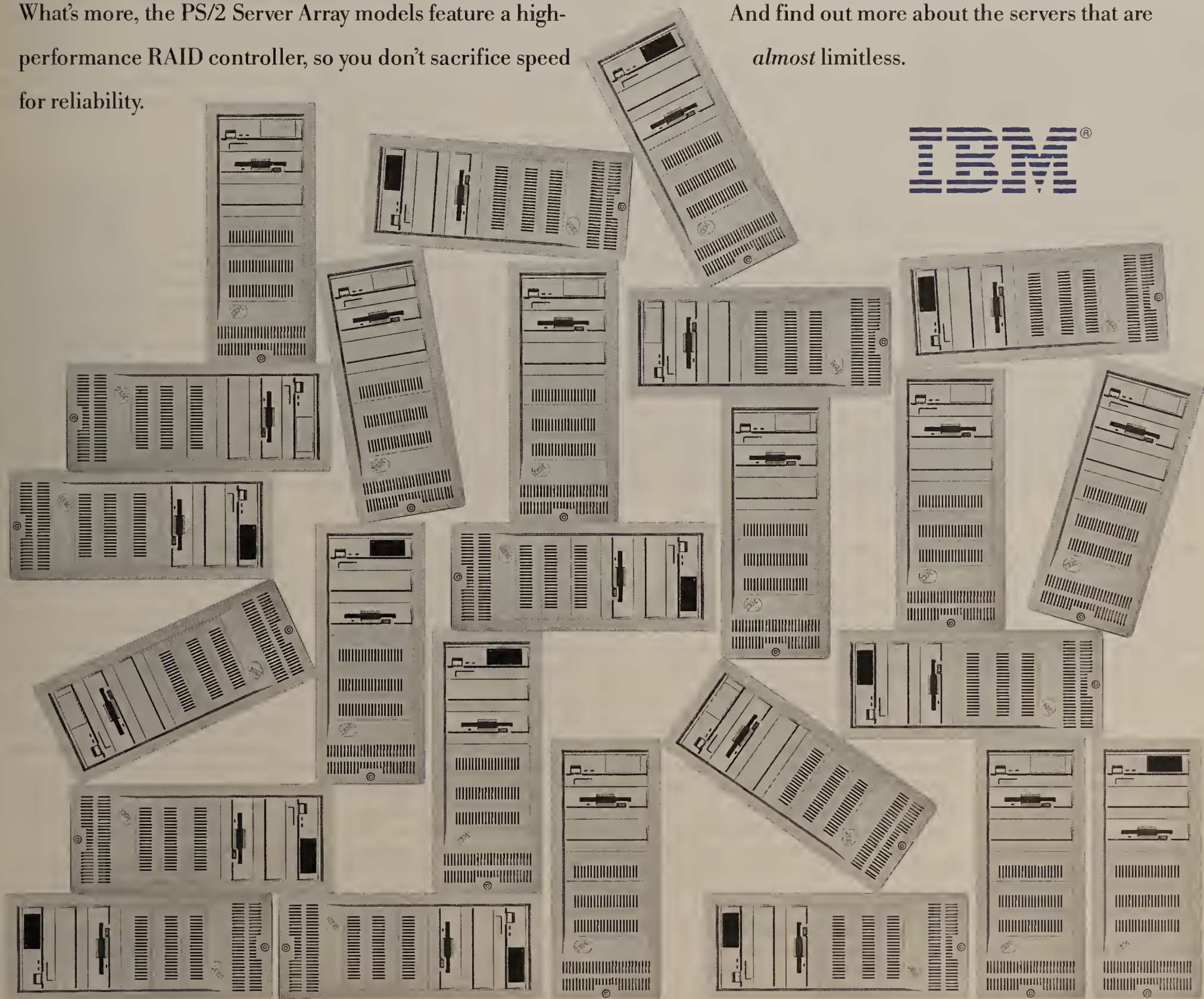
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Sallie Mae approves move to \$55m imaging network

Student loan company to get lesson in LANs.

BY CARYN GILLOOLY

Washington, D.C.

Sallie Mae, the major issuer of student loans in the U.S., last week signed a five-year, \$55 million contract with systems integrator Price Waterhouse to build one of the largest imaging systems ever.

Price Waterhouse will replace the Student Loan Marketing Association's 3,000 mainframe-attached terminals with seven local-area networks comprising 100 servers and about 3,000 personal computers that will serve as the platform for the new imaging system.

Sallie Mae expects to recoup the cost of the downsizing move and imaging system within five years. But its primary motivation for overhauling the network is to gain a competitive edge by cutting the time it takes to access customer information and, as a result, process loans faster.

"The main benefit here is improved customer service," said Don Coleman, vice president at Sallie Mae, based here. "The new system will let us improve the accuracy

and speed at which we can access customer account information."

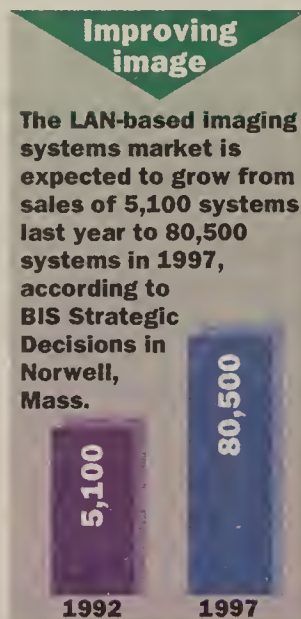
Currently, Sallie Mae has neither LANs nor an imaging system, but uses only a mainframe and reams of paper.

Sallie Mae services almost four million student loans with life spans as long as 33 years. The company deals with up to 54 million records each year — nearly all of them paper-based. That would amount to 9,500 miles of paper if those documents were laid end to end.

When a customer has a question about a loan, a Sallie Mae representative in one of seven customer service locations currently has to establish a session with the mainframe to get basic customer information. The representative then has to find files and microfilm containing documents pertaining to that particular account.

"We can have 25 to 30 documents per borrower file," Coleman said. "Accessing customer information can take from hours to days."

But that's about to change. Price Waterhouse this month will begin replacing Sallie Mae's 3,000 terminals — most of which are used for customer service — with about as many Intel Corp. 486-based personal computers as well as about



New features for CPI-C spec set for approval

BY MICHAEL COONEY

Raleigh, N.C.

IBM and fellow vendors in the CPI-C Implementors' Workshop (CIW) last week put the finishing touches on what will become the most strategic version of the communications interface.

New features of Common Programming Interface for Communications (CPI-C) Level 2.0, which will be available by March, include full duplex communications, multi-vendor directory support and a variety of other improvements designed to make CPI-C applications more powerful and easy to use.

CPI-C is a standard high-level interface compared to IBM's Advanced Program-to-Program Communications/LU 6.2 session type. It includes more than 30 standard application calls and other features designed to give users and developers a consistent way to access LU 6.2-based applications, which in turn will help ensure that applications from different vendors will be able to interoperate across a distributed network.

CPI-C has evolved and can now also be used to support applications built for Transmission Control Protocol/Internet Protocols. X/Open Consortium, Ltd., a consortium of vendors trying to develop the Common Applications Environment, has

also adopted CPI-C as its standard for developing client/server transaction processing applications.

IBM formed the CIW in the fall of 1992 to bring together key developers and users — including Attachmate Corp., Eicon Technologies Corp., Apple Computer, Inc. and Boeing Computer Services — to speed CPI-C's growth and better define requirements for future enhancements.

There are a few items IBM and the CIW expect to clear up in the next few months, said Chuck Terrien, a manager in IBM's Advanced Program-to-Program Communications market-enablement group.

For one, the CIW is sending CPI-C 2.0 documentation to X/Open to see if the consortium has any additional feature requests. And the CIW has to agree on which set of features vendors must implement before they are considered compliant with the specs.

"That is a key agreement we need to settle on because if developers are forced to implement too much you could see vendors not moving to CPI-C 2.0 very quickly and IBM doesn't want that," said Miles Ulrich, manager of Systems Network Architecture products with Wall Data, Inc., an SNA software developer based in Redmond, Wash.

Terrien said he does not anticipate any problems with conformance levels.

One of the new features in CPI-C 2.0 is

100 Sun Microsystems, Inc. servers.

Each site will have one or more Ethernet LAN as well as a Fiber Distributed Data Interface backbone, which will be tied into the central mainframe via a wide-area network connection. A network operating system has not yet been chosen.

Each site will also have at least two imaging servers — one primary server and one for backup — running Recognition International, Inc.'s FloWare, XDP and XDC imaging and work flow software. Symmetrical Technologies, a subsidiary of Network Imaging Corp., will supply the optical storage peripherals.

"With the new system, as work comes into the [customer service] centers, papers will be scanned in and put on an optical disk," which will be attached to an imaging server, Coleman said.

Customer service representatives will then be able to access all customer information, including documents, from their desks via the network.

"We'll have immediate access to all documents," Coleman said.

The images will be stored locally for 45 days, then moved to a central repository, which will house images from all the customer service centers. To ensure system uptime, there will also be a redundant repository that will be on-line at all times if the primary repository fails.

Sallie Mae's mainframe will not become obsolete, but rather will continue to provide data on account financial information, Coleman said.

The new imaging system is scheduled for completion in 1996, although Price Waterhouse will continue to administer the net for the duration of the five-year contract. ■

the long-awaited support for full duplex communications between CPI-C applications. Full duplex support will let programs send and receive data simultaneously so applications do not have to wait for a transmission to finish before beginning to receive something else as they have to today.

A query feature will let CPI-C 2.0 applications query other CPI-C applications to determine their level of CPI-C support. This will let a CPI-C 2.0 application recognize a CPI-C 1.2 application and communicate via the half duplex sessions that CPI-C 1.2 uses. CPI-C 2.0 will also include support for multi-vendor distributed directories.

CPI-C 2.0 applications will be able to support multi-vendor directory services, such as X.500 and the directory used by the Open Software Foundation, Inc.'s Distributed Computing Environment.

The distributed directory support would also let CPI-C 2.0 applications communicate without knowing where the other program is located. Currently, proprietary "side directories" are required to store locations of CPI-C applications, Terrien said.

The CIW also will add improved CPI-C support for the Open Systems Interconnection Transaction Processing (TP) standard, OSI/TP, to CPI-C 2.0. CPI-C Level 1.2 contains basic support for OSI/TP, but CPI-C 2.0 will be able to determine the status of another CPI-C application before any transaction data is transmitted.

This feature prevents CPI-C or OSI/TP applications from sending data across the net to a node that is off-line or out of service.

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Microsoft, DEC to link distributed object technologies

BY ADAM GAFFIN

Microsoft Corp. and Digital Equipment Corp. last week announced plans to develop a set of object-based distributed networking interfaces that could open Windows desktops to a range of applications on other platforms.

The move also puts pressure on the Object Management Group (OMG), an industry consortium, to develop its own set of standards for getting objects to talk to each other across networks.

Microsoft and DEC will work together to develop a Common Object Model (COM) to integrate Microsoft's Object Linking and Embedding (OLE) technology with DEC's ObjectBroker. OLE allows for object-based applications and data exchange on Windows platforms, while ObjectBroker brings similar capabilities to networks and computer systems beyond those based on Windows.

The vendors will implement a communication protocol based on the remote procedure call technology of the Open Software Foundation, Inc.'s Distributed Computing Environment to integrate OLE and ObjectBroker for invoking objects across a network.

Bob Marcus, organizer of Corporate Facilitators of Object-Oriented Technologies, a user group, said the Microsoft-DEC agreement is "a step in the right direction."

But it falls short of what he would like to see — an interface that lets developers easily mix applications with any object-based net environment.

Chris Stone, president of OMG — which is seeking to create its own set of standards for distributed networking environments — called the Microsoft-DEC announcement a good first step for Microsoft since ObjectBroker is based on his group's Common Object Request Broker Architecture (CORBA). CORBA lays out guidelines for getting objects on different platforms and networks to talk to each other.

OMG, based in Framingham, Mass., has a Dec. 8 deadline to receive proposals for its net interoperability standards. They will make up a large portion of CORBA 2.0, scheduled for completion by mid-1994.

The Microsoft-DEC announcement "puts a lot of pressure on OMG to deliver CORBA 2.0," in part because it gives Microsoft a way to use CORBA without having to make any commitments to OMG and its standards process, said Wayne Eckerson, an analyst with Patricia Seybold Group in Boston.

Microsoft and OMG have long disagreed on how to link object-oriented programs in heterogeneous networks. Eckerson said the effort with Digital was a clever way for Microsoft to gain entry into the CORBA world without having to commit itself to the CORBA development process.

With DEC's software, Microsoft gains access to platforms already supported by ObjectBroker, including Windows, Windows NT, Macintosh, DEC's OpenVMS and five variants of Unix, Eckerson said. DEC, which has been most active in the server environment, wins better integration with Windows and Windows NT client applications, he said.

Microsoft and DEC plan to release draft specifications of COM early next year, with beta testing of fully functional software to begin in the third quarter. ■

COM on now

The Common Object Model (COM) is an emerging Microsoft-DEC technology for linking applications compliant with Microsoft's Object Linking and Embedding and DEC's ObjectBroker object technologies.

GRAPHIC BY SUSAN J. CHAMPENY

Sybase ships its replication pack, offers to buy consultancy

BY PETER LISKER

Sybase, Inc. will this week begin shipping its long-awaited Replication Server software, key technology for distributing databases across a network. Separately, Sybase last week announced plans to acquire a London-based consulting firm that specializes in reengineering.

In other database industry news, Gupta Corp. this week plans to unveil a new product for administering client/server databases, while data warehouse vendor Red Brick Systems will launch enhancements to its products, as well. These products will debut at the Database World conference in Chicago.

Sybase's Replication Server, an integral part of the vendor's SQL Server 10 product line, is the first commercially available replication facility from a major database vendor. The product will enable users to copy data across databases to synchronize and track change to distributed databases. Pricing information was not available.

Malcom Colton, vice president of server marketing at Sybase, said, "Sybase's Replication Server will allow customers implementing distributed database systems to be sure that all changes that occur at any site will be propagated through the network to ensure complete data integrity."

Sybase separately announced plans to buy consultancy OASiS Group, PLC for \$21 million in Sybase stock. The acquisition of OASiS let Sybase customers contract with the company to provide reengineering expertise that is difficult to cost-justify internally. The move to buy out OASiS is a strong play by Sybase to counter rival Oracle Corp.'s move earlier this year into the lucrative consulting and reengineering market.

The companies will work together to build applications based on Sybase's Enterprise Momentum toolset, as well as provide customized applications for OASiS clients.

GUPTA, RED BRICK PRODUCTS

At Database World, Gupta will announce availability of SQLConsole, a graphical user interface-based database administration and monitoring tool. The software is designed to simplify the configuration and maintenance of distributed databases.

SQLConsole, based on the SQL Monitor tool developed by the Ontario-based Client/Server Factory, brings real-time graphing of database administrative information to the desktop. The product also provides a drag-and-drop database partition manager and a facility that graphically shows the execution of database processes.

The product is designed to let nontechnical database users easily perform such tasks as automated backup and recovery operations. It also provides a facility for developers to debug and optimize client/server applications.

Gupta officials declined to comment on pricing.

In other Database World news, Red Brick Systems will demonstrate its enhancements to its existing Red Brick Warehouse product. The enhancements are designed to cut the time it takes to load and index massive amounts of data into its data warehouse environment, as well as improving usability.

Red Brick's new Parallel Table Management Utility will allow users with symmetric multiprocessing hardware to build indexes and perform referential integrity data checks in parallel. This facility will enable users of very large databases, typically over 100G bytes, to rapidly load and access information in data warehousing applications across a network. The company claims that a database of this size can now be loaded in a single weekend.

In addition, Red Brick will announce sup-

port for Microsoft Corp.'s Open Database Connectivity (ODBC) database access specification. This will enable ODBC-compliant application development and data access tools to work with Red Brick data repositories. Red Brick's ODBC Driver will also support Sybase's Open Client protocol, providing connectivity with large numbers of ODBC-enabled applications. Red Brick Warehouse software costs between \$20,000 and \$320,000.

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Lotus, Simpac tools turn phones into Notes clients

BY ADAM GAFFIN

Cambridge, Mass.

Lotus Development Corp. and Simpac Associates, Inc. this week will announce the beta release of programming tools that can open Notes databases to users of push-button telephones.

The companies said Phone Notes, which they jointly developed, is a set of open interfaces for integrating Lotus' Notes groupware with applications that let callers retrieve information and leave messages by pushing buttons on their telephones.

The tools consist of a modified version of the Notes application program interface and a set of 17 new fill-in-the-blank Notes documents that let developers and end users build applications for accessing and manipulating Notes databases via the phone. The vendors said this will allow for any number of help desk, customer service and mobile worker applications to be designed.

Simpac, of San Diego, said its Remark PhoneClient 2.0 software will be the first voice response program to use Phone Notes. When coupled with the company's Remark Phone Server, PhoneClient 2.0 will allow for

creation of programs that let callers hear voice-synthesized versions of information from Notes databases and let them embed voice messages within Notes documents.

PhoneClient for Notes runs under OS/2 on a server and works with Simpac's Remark Server software to handle incoming phone calls and to provide voice processing functions.

Simpac's PhoneClient 1.0, released earlier this year, allowed for some phone interaction with Notes databases but had limited development tools for end users.

In August, another vendor, Edify Corp., added Notes support and development tools to its Electronic Workforce application to allow phone-based data retrieval from Notes and various database products.

"The Lotus announcement legitimizes the trend toward merging voice response and groupware technologies we see taking place," said Tom Glassanos, vice president for marketing at Edify Corp. "Lotus is going to do the [voice response] market tremendous good."

David Rome, general manager of Lotus' Companion Products Division, acknowledged that there are limitations on what can

be done via a telephone, but said these are outweighed by the fact that far more people have access to telephones than to personal computers running Notes. Laptop users might find dialing in to a Notes database easier than trying to find a modem-compatible phone to plug a computer into, Rome said.

David Marshak, an analyst with Patricia Seybold Group, Inc.'s Office Computing Group in Boston, said the announcement marks the first time Lotus has committed to development of applications that let people access Notes databases without a Notes client.

"It breaks the Notes model," he said.

For Lotus, this move brings some risks, he said. Users could spend \$495 for a Notes server and set up a way to allow hundreds of people to access Notes without any additional licensing fees. Then again, it could also make Notes more attractive to companies that have large installed bases of non-Notes systems, he said.

Lotus said it expects to begin shipping Phone Notes by mid-1994. Simpac predicted a similar shipping date for its revised Remark PhoneClient.

Simpac said pricing for Remark PhoneClient 2.0 will be based on the number of incoming phone lines and will start at \$2,750 for a single line. Rome said pricing has yet to be announced for Phone Notes.

©Lotus: (617) 577-8500; Simpac: (619) 565-1865.

Schwab

Continued from page 1

"It will enable us to react to the market quickly, to be able to bring on additional capacity if need be," said Michael Negatu, director of systems integration for Schwab.

The company is moving to a DCE-based client/server environment from a hierarchical, mainframe-centric IBM Systems Network Architecture net to accommodate rapid growth. Schwab processes 30,000 transactions — including stock trade and mutual fund transactions daily, up from 13,000 per day in 1990 — and has added more than a half-million new customer accounts since the beginning of the year.

"To grow in a mainframe environment is becoming more and more difficult," Negatu said. "Upgrading a mainframe takes a great deal of planning. Adding additional servers to a certain segment of the country is relatively fast."

The Hitachi, Ltd. mainframe will still house customer records, such as existing investment portfolios. Schwab will also continue to use IBM's NetView for managing SNA sessions between 3270 terminals and the host.

As operations become more distributed, however, the Tivoli product will become Schwab's key management system.

Initially, the Tivoli software will manage a DCE subnetwork, or cell, in Schwab's trading center here. Eventually, Schwab's network will include six DCE cells nationwide linked by Internet Protocol routers over T-1 and T-3 lines.

The cell handles stock, bond and mutual fund orders taken over the phone. Client workstations in the cell house applications for processing the phone orders, while the servers handle trades and requests for market data. The servers also provide access to the Hitachi mainframe, which is located at Schwab's data center just outside of Phoenix.

Tivoli software will reside on a Unix server in the cell and every workstation to be managed. The servers will also support management applications, such as Tivoli/Works and Tivoli/Courier, and LEGENT Corp.'s Paradigm trouble-ticketing system.

Tivoli/Works monitors the configuration of DCE nodes and associated resources, and stores this information as objects in its database. Tivoli/Courier handles software distribution.

Using a graphical user interface at the data center, a network administrator will be able to establish management policies, such as user password schemes and configuration parameters for workstations and servers.

Once the policies are established, they can be written into a software template that is distributed to the Tivoli servers, which will download them to each workstation and server in the cell.

When a workstation or server is added to the DCE network, Tivoli/Works will register its location and configuration in its database. Tivoli/Courier will then distribute the appropriate software and files to the new system.

If a disk on a server is nearing capacity, for instance, it will send an alert to the Tivoli server, which will then launch a Paradigm trouble ticket. The trouble ticket will automatically be populated with information about the affected device from the Paradigm database, and the administrator can act on it or route the trouble ticket to a more appropriate technician.

Schwab chose to deploy Tivoli for its DCE network because its object orientation provides management flexibility and scalability, Negatu said.

"Objects provide the ability to rapidly add and subtract workstations or any kind of entities," Negatu said. "There will be times when our business demands adding or subtracting certain components. With objects, it will be easy to do that." ■

Brady bill puts states under gun to network

BY JOANNE CUMMINGS

Washington, D.C.

With the passage of the Brady bill last week, several state law enforcement agencies are scrambling to get their crime records automated and networked in the face of uncertain fiscal aid.

The bill, which President Clinton signed into law last Tuesday, gives each state 90 days to institute a five-day waiting period on the purchase of handguns, during which police are required to conduct a background check of prospective buyers' criminal and mental health history. The waiting period would be dropped after five years, when a national computerized instant-check system is scheduled to be operational.

Although the bill earmarks \$200 million for the states to help them update their systems and enable them to participate in the national instant-check program, many officials are skeptical that the funds will come through or that they will be enough to help the more than 25 states that have yet to automate their crime records.

And officials are even more pessimistic about being able to comply with the mental health check requirement since few have implemented automated systems in that area.

"That's not very much money, and it still has yet to be appropriated," according to a spokesman for the Bureau of Alcohol, Tobacco and Firearms here. "That's the next step, to legislate the money for this."

Money issues aside, some states that have yet to automate crime records anticipate problems getting on-line in time to tie into the national network in five years, never mind getting up to speed in 90 days. The bill does not require states to have automated systems within 90 days, but such systems would go a long way toward helping them meet the background check requirement.

"We've been working on automating our records, through various grants and programs, for about two years now," said Sgt. Thomas Barrick, director of criminal records for the state of West Virginia. "I

don't see that being completed for another two years — and that's optimistic."

When that two years is up, West Virginia will be able to automate new criminal records, but will still have to work on putting back files on-line. "I see us getting fully up to speed in about three or three and a half years," he said.

Barrick estimated that the state's current automation plan will cost about \$1 million just for the hardware and software needed, such as computer terminals for a staff of operators fielding background check calls and a mainframe-resident database for crime records.

"But that doesn't include linking up with the federal system, hiring the number of employees we'll need or whether we'll have to put in a separate phone system to handle background check calls," he said. "And depending on the number of guns purchased in West Virginia, we might even need to have a new facility to accommodate this. It's going to be expensive."

Other states are in less dire circumstances because they have already instituted their own automated background check systems.

"We won't be affected really at all by the Brady bill," said John Joyce, public information director for the Florida Department of Law Enforcement in Tallahassee, Fla. "We've had our own automated system in place since February 1991, and have had a three-day waiting period to purchase handguns since 1990."

Florida's crime record network, called the Florida Crime Information Center (FCIC), is currently networked with the National Crime Information Center in Washington, which tracks federal crime records. "We won't need to put anything new in place to comply," he said. "And we already have an instant check system."

FCIC accepts calls from gun dealers via an 800 number, he said. After the dealer presents an identification number and provides information on the prospective gun buyer, the system can run a background check and return results in an average of 3.5 minutes.

The 800 calls are fielded by about 25 operators sitting at terminals linked to the mainframe-resident FCIC crime database. Since the system's implementation in 1991, Florida has successfully conducted background checks on some 738,000 prospective gun buyers, Joyce said.

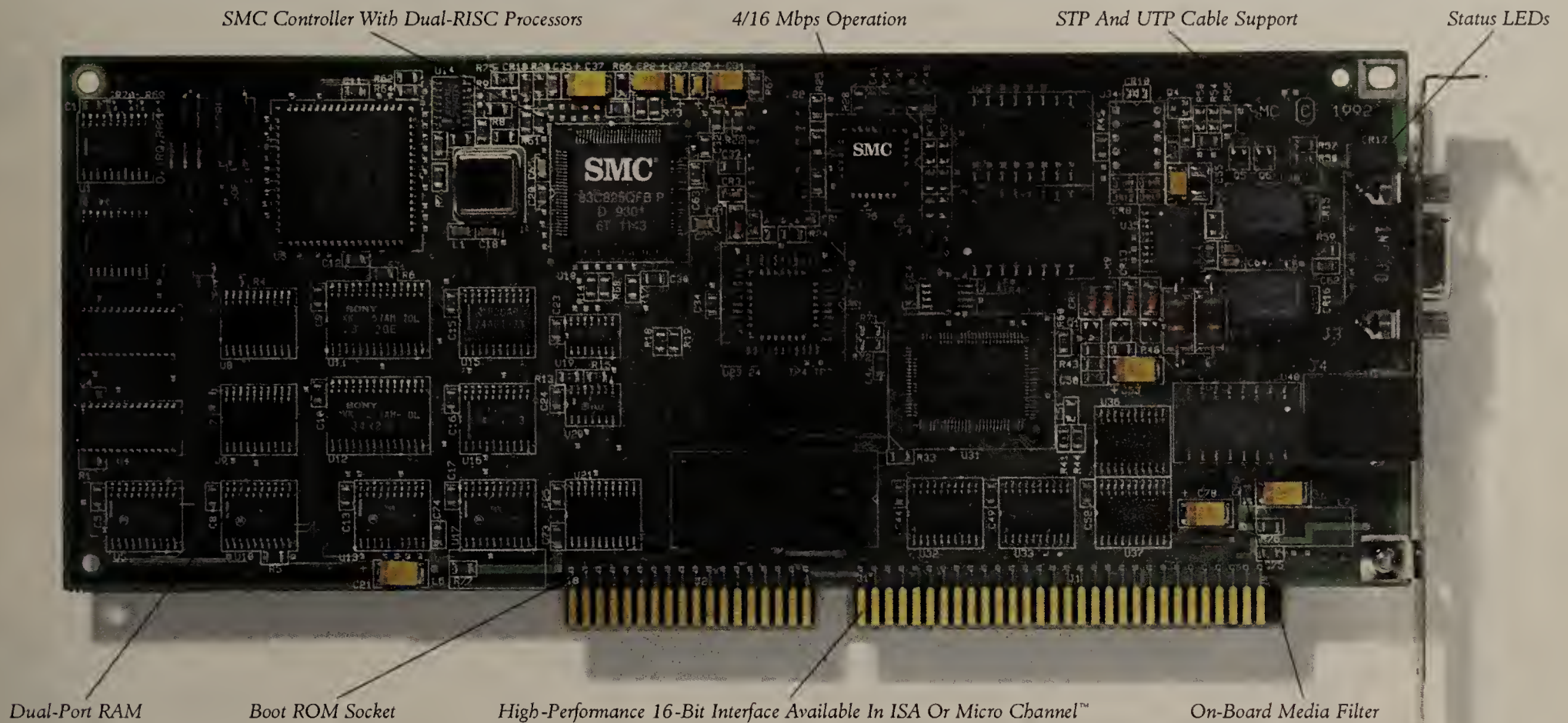
Brady bill offers states networking headache

- Mandates that states conduct a background check on prospective gun purchasers during a 5-day waiting period.
- Within 5 years, states must automate crime records and tie into the national network.
- Number of states yet to automate: 25
- Money earmarked for automation: \$200 million (yet to be formally appropriated)

SOURCE: BUREAU OF ALCOHOL, TOBACCO AND FIREARMS, WASHINGTON, D.C.
GRAPHIC BY TERRI MITCHELL

Cummings is a free-lance writer in Marlborough, Mass.

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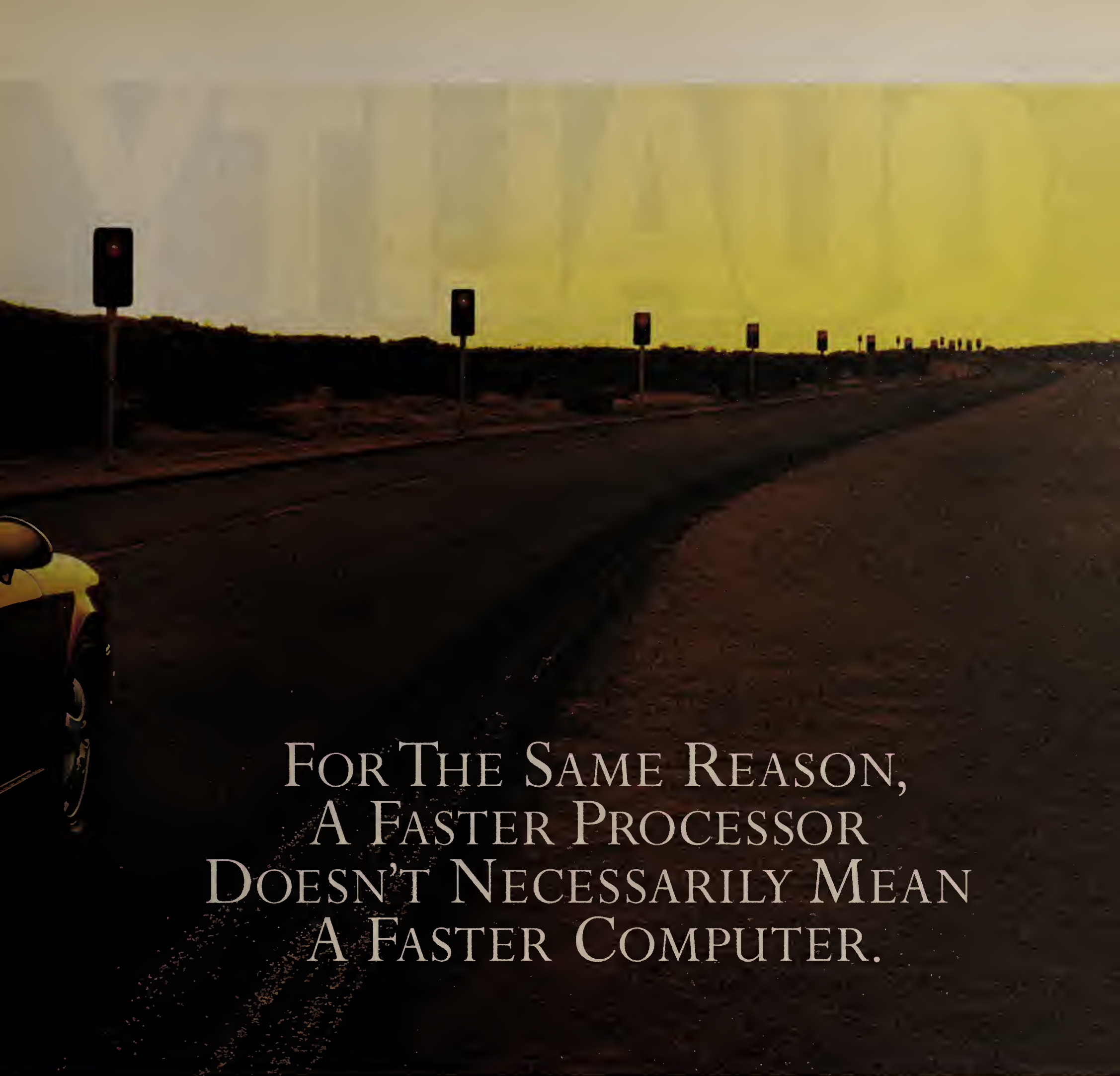
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BRIEFS

Galaxy Networks, Inc. has unveiled a modem for notebook computers that lets users establish 3270 sessions with IBM Systems Network Architecture hosts. The Gemini Mini SNA modem comes with communications software that allows a personal computer's serial communications port to transmit a synchronous 9.6K bit/sec SNA data stream as well as asynchronous data. This obviates the need for users to purchase and install add-on synchronous serial port boards.

When an SNA session is complete, users can access any asynchronous application without reestablishing the modem connection or entering extended commands, according to the company.

The Gemini Mini SNA modem costs \$995, including software. It is available now.

Galaxy: (818) 998-7851.

NCR Corp. last week brought out software that lets users and developers build management applications using Open Systems Interconnection protocols.

NCR's StarPro Common Management Information Protocol (CMIP), an implementation of the OSI CMIP management protocol, has been integrated with NCR parent AT&T's BaseWorX Unix-based application development and run-time software. Users and developers can now use BaseWorX to write management applications that use CMIP, such as programs that foster manager-to-manager communications between management consoles.

StarPro CMIP runs on NCR System 3000 processors. It can run over OSI and Transmission Control Protocol/Internet Protocol nets via NCR's RFC 1006 software, StarPro OSI/TCP Connect.

StarPro CMIP costs \$12,750 and is available now.

NCR: (513) 445-5000.

NETWORK MANAGEMENT

IBM adds more powerful network monitors to line

BY MICHAEL COONEY

Raleigh, N.C.

Systems Network Architecture users can now gain an improved real-time view of their network performance and respond to network problems more quickly with new releases of software for two of IBM's more strategic net management products.

IBM announced NetView Performance Monitor (NPM) Version 2 Release 1 and Distributed Console Access Facility (DCAF) Version 1 Release 2. NPM is a VTAM application that collects SNA and IBM Token-Ring local-area network performance data from VTAM on the mainframe and from the Network Control Program on the front-end processor. It lets users monitor session response times and measure the amount of data flowing through the net.

DCAF is a centrally located OS/2-based

management program that lets help desk operators take over and control remote OS/2-based workstations.

"The new releases will give SNA users more information about their SNA network and LANs tied to the SNA network," said Anura Guruge, an independent consultant based in New Ipswich, N.H. "But it doesn't complete the picture by a long shot."

Many SNA users are bringing LAN traffic via a 3172 Interconnect Controller, and NPM still can't monitor that, Guruge said. According to IBM, it was working on adding the ability to monitor LAN traffic linked to the mainframe via a 3172 but did not say when that feature might become available.

Perhaps the biggest user complaints about NPM were that its information was not reported in real time — rather, it has been more of a historical performance mon-

itoring tool — and that the data it reported was not presented graphically on a color screen.

The new version of NPM eliminates both problems. It lets users monitor data traffic volume, tune and load-balance their SNA nets in real time from a new OS/2-based Presentation Manager screen, called NPM Desk/2, said Harry Hall, an NPM product planner with IBM.

The Desk/2 OS/2 monitor replaces the existing character-based 3270 NPM interface and supports links to the mainframe via an LU 6.2 session or Token-Ring LAN.

According to Hall, Desk/2 eliminates the need for users to flip through multiple 3270 screens to find information and lets them display multiple screens simultaneously.

The new NPM will also let SNA users gather more information about their SNA resources. For example, users will for the first time be able to monitor VTAM's buffer pools, which expand and contract as data flow increases and decreases, Hall said.

Users will also be able to see the links between individual devices and VTAM, letting them watch for specific problems such

See IBM, page 17

DEC unveils DECnet/OSI for OpenVMS on Alpha

BY JIM DUFFY

Maynard, Mass.

Digital Equipment Corp. last week made migration from its traditional VAX platforms to its new Alpha hardware a little easier when it unveiled DECnet/OSI networking software for the OpenVMS AXP operating

system.

DECnet/OSI Version 2.0 for OpenVMS AXP is the first version of DEC's dual-protocol networking software for OpenVMS-based Alpha systems. Earlier this year, DEC

brought out DECnet/OSI Version 1.1 for OSF/1 AXP, which runs on Alpha hardware under the DEC OSF/1 operating system.

An OpenVMS AXP version, however, will provide more of an incentive for DECnet/OSI users looking to

migrate from DEC's legacy VAX architecture to the new Alpha systems because the vast majority of VAX users run VMS or OpenVMS.

DECnet/OSI 2.0 for OpenVMS AXP integrates DECnet and Open Systems Interconnection protocol stacks and lets OpenVMS AXP-based Alpha systems participate as end nodes in a DECnet/OSI net. The protocols are integrated up to Layer 4, or the transport layer, of the DECnet and OSI stacks.

After that, the session, presentation and application layers are separate DECnet and OSI "towers," as DEC refers to them.

Features of DECnet/OSI Version 2 for OpenVMS AXP:

- ▶ Integration of DECnet and OSI protocol stacks for support of OSI and existing DECnet applications.
- ▶ Application-layer gateways for communicating between DECnet/OSI and TCP/IP systems.
- ▶ Support for U.S. and U.K. Government OSI Profile specifications.
- ▶ 160-bit OSI addresses support networks with millions of nodes.
- ▶ Built-in utilities to simplify installation, configuration, troubleshooting and transition from DECnet Phase IV to DECnet/OSI.
- ▶ Support for OSI FTAM and Virtual Terminal protocol applications.

SOURCE: DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
GRAPHIC BY TERRI MITCHELL

Integration at the transport layer means that existing DECnet Phase IV applications can use OSI transport mechanisms — TP0, TP2 and TP4 — when communicating to an OSI end node.

Other features of DECnet/OSI 2.0 for OpenVMS AXP include OSI application gateways, OSI addressing, built-in network management utilities, OSI File Transfer, Access and Management (FTAM) and Virtual Terminal protocol applications, as well as support for U.S. and U.K. Government OSI Profile requirements.

OSI application gateways enable users to access Transmission Control Protocol/Internet Protocol files and applications using OSI file-transfer and terminal-emulation protocols.

Future versions of DECnet/OSI will support the Internet Engineering Task Force's RFC 1006, which will allow users to access DECnet/OSI applications from a TCP/IP transport stack, said Mary Ellen Fortier, DEC's Advantage Networks marketing manager. Originally, DEC planned to integrate the TCP/IP stack into DECnet/OSI, she said.

"The initial plan at one point in time was to provide even tighter integration of DECnet/OSI and TCP/IP," Fortier said. "Currently, we do not plan to integrate the TCP/IP stack into the dual-protocol stack. The plans are to provide [RFC 1006] in a future release on OpenVMS for both VAX and Alpha platforms." That would provide

See DEC, page 17

Wellfleet, Hughes to pair router hub

BY MAUREEN MOLLOY

Mountain View, Calif.

Hughes LAN Systems, Inc. and Wellfleet Communications, Inc. last week signed an agreement to jointly develop products that integrate routing, switching and ATM technologies in Hughes' Enterprise Hub.

In a separate announcement last week, Wellfleet said it has extended its Transmission Control Protocol/Internet Protocol suite to include the Border Gateway Protocol (BGP) on its line of routers.

By integrating Wellfleet routing into Hughes' high-end hub, users will be able to improve the performance of their collapsed backbone networks, said Bobbie Murphy, Hughes' vice president of marketing.

The hub/router will route traffic locally between multiple local-area network segments and provide a link to the Wellfleet Backbone Node router, which will be used to anchor a collapsed backbone net and

provide wide-area links. This will reduce the amount of traffic between the hub and the backbone router, thus improving overall network performance.

The Enterprise Hub can also feed traffic to an Asynchronous Transfer Mode (ATM) switch, such as Wellfleet's planned integrated ATM Router/Switch (NW, Oct. 26, 1992, page 1).

The Enterprise Hub supports Ethernet, token-ring and Fiber Distributed Data Interface LANs and synchronous and asynchronous terminal servers with distributed bridging and routing over a 1.6G bit/sec ATM backplane.

Wellfleet will develop router modules for the Hughes Enterprise Hub that will support Ethernet, token-ring, FDDI and wide-area interfaces. Hughes will contribute a new ATM access module that connects the new routing modules to the Enterprise Hub ATM backplane or to an external ATM switch at speeds up to 155M bit/sec.

The products are expected to be available by mid-1994.

In addition to joint technology development, Hughes announced that it will also begin reselling Wellfleet's line of stand-alone routers. The two companies will also be implementing a so-called Unified Support Agreement that covers technical support and service for both the integrated and stand-alone routers.

See Pair, page 17

by Ed Krol

Fearing Internet privatization

Last month, I tried to explain that commercialization is a positive growth factor for the Internet. But, unfortunately, in order to commercialize, the Internet must be privatized. I have two fears about privatization, one for realists and one for paranoids.

First, though, I'd like to dispel the widely held belief that the reason all us Internet folks are against privatization is that we are freeloaders wanting to receive a service without having to pay for it. I don't think this is really the case.

A university, getting a connection for free because of a subsidy, will have to pay for it in

the future. But will I, as an employee, have to pay for it personally? No, it will still be a perk of my job. And even if I do have to pay for Internet access, the rates in most large cities are reasonably in tune with what you pay for a telephone today — it's not going to break me.

The realistic fear is that cost recovery will be done in such a way that Internet culture will be destroyed. Unfortunately, accounting was not figured in when the Internet was designed. Retrofitting it into the Internet now will be tough, and there are conflicting views on how to do it.

Internet consumers favor a fixed-price con-

tract, much the same as it is now. You, or your institution, buy a level of service based on bandwidth, say 9.6K bit/sec, and your service provider has to digest as many packets as you can possibly pump down that line. This makes budgeting easy and brings positive behavioral aspects regarding usage: Once you pay, you should get your money's worth.

Flat rates make engineering and planning very difficult for Internet carriers. They are in the business of making a profit running a piece of the largest statistical multiplexer ever built. They need to buy connections to other providers that are big enough to handle peak demand, but to keep rates low, they overbook those links.

If, suddenly, a bandwidth-hungry application comes into wide use, they may be caught paying contract penalties for giving rotten service. So these folks frequently want some kind of usage-based charging.

There are two problems with this kind of charging, both of which strike at the heart of Internet culture.

One is that most of the cooperative spirit of the Internet is based on people giving away information through their spare capacity and cycles for the good of the community. If I have a Sun Microsystems, Inc. workstation on the Internet and have 100M bytes of disk free, I could put it up as a resource. But if I get charged by the packet, there's no way I am going to provide a volunteer service because the better the service, the more it costs me. Charging to give away information will shut down 90% of the current Internet resources.

The other problem with charging by use is that costs are not predictable. How do you budget for a service when doing the same thing two times in a row may yield different charges because the packets may be routed differently or a noisy line may force retransmissions?

Even worse, what happens when your kids run up a big bill because they discovered this multimedia hypertext application called NCSA Mosaic? How did they know that clicking the dinosaur icon would transfer 3M bytes?

My worry is best expressed by comedienne Lily Tomlin in her portrayal of the telephone operator. The dialog goes something like:

"We noticed your bill is in arrears."

"Well, I am a bit short of cash."

"I am looking at your tax return now, and you should be able to pay."

"But those are supposed to be private."

"[Chortle] Oh, Mr. Smith, you are so funny. Don't you know you are dealing with the telephone company?"

The privatization scenario started with the premise that if we privatize, things will be cheaper because we will be able to buy network access from competing vendors in a marketplace. Now, with merger-mania running rampant in the telephone company and cable industries, it appears that one group will have a monopoly over the information spigot in your house, and with information goes power.



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♦ Krol is author of *The Whole Internet* (O'Reilly & Associates, Sebastopol, Calif., 1992) and assistant director for LAN deployment at the University of Illinois at Urbana-Champaign. He can be reached at e-krol@uiuc.edu.

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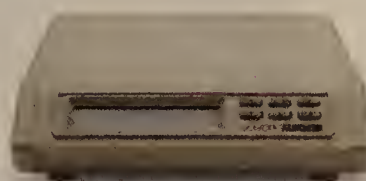
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BlueLine Software adds NetWare to SNA mix

BY MICHAEL COONEY

Minneapolis

Users looking to tie together their Novell, Inc. NetWare and Systems Network Architecture nets can look to BlueLine Software, Inc. for help.

The company last week announced NetWare for MVS/SNA Router and NetWare for MVS/E-Z Access, software designed to make the SNA mainframe a large NetWare server in an enterprise net.

The products are intended to let users add NetWare local-area networks to their SNA infrastructure and use existing SNA backbones to link NetWare LANs without disrupting SNA traffic, said Willard Cecci, president and chief executive officer of BlueLine.

NetWare for MVS/SNA Router is mainframe software that lets NetWare clients and servers transfer files over an SNA net and store

them on the MVS mainframe. The product does not require the NetWare server or client to emulate a 3270 terminal, but it does require Novell's NetWare for SAA Gateway to provide a link to the SNA net.

NetWare for MVS/E-Z Access is also mainframe software, but it lets the mainframe route NetWare LAN traffic over the SNA net to other

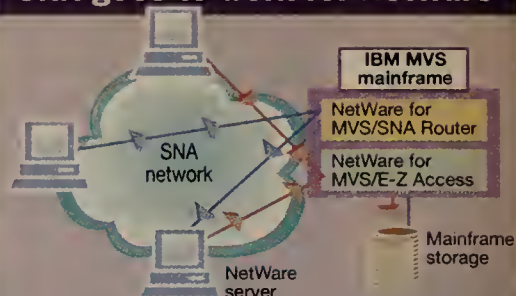
NetWare LANs. It works by encapsulating the NetWare data inside an LU 6.2 session and passing the data between NetWare servers. It likewise requires use of Novell's NetWare for SAA gateway.

The biggest benefit to SNA users is that they can add NetWare LAN traffic to the SNA backbone without adding a router or increasing their bandwidth, Cecci said.

Pricing for the NetWare for both the MVS/SNA Router and NetWare for MVS/E-Z Access start at \$18,000. Both products are available now.

©BlueLine Software: (800) 826-0313.

SNA goes to work for NetWare



Two new software packages from BlueLine enable an SNA mainframe to be used as a storage facility for Novell, Inc. NetWare LANs and to route NetWare data across SNA backbones.

SOURCE: BLUELINE SOFTWARE, INC., MINNEAPOLIS
GRAPHIC BY TERRI MITCHELL

Firm licenses object technology

BY JIM DUFFY

Pleasanton, Calif.

Network management start-up OpenVision last week said it will use technology from Digital Equipment Corp. to give its systems management product new object-oriented distributed management capabilities.

OpenVision will base its OpenV Distributed Application Environment (DAE) on DEC's ObjectBroker technology. ObjectBroker, which complies with version 1.2 of the Object Management Group's Common Object Request Broker Architecture (CORBA) specification, is software that allows an application to request and invoke the services of any other application or object on the network, regardless of where it is located.

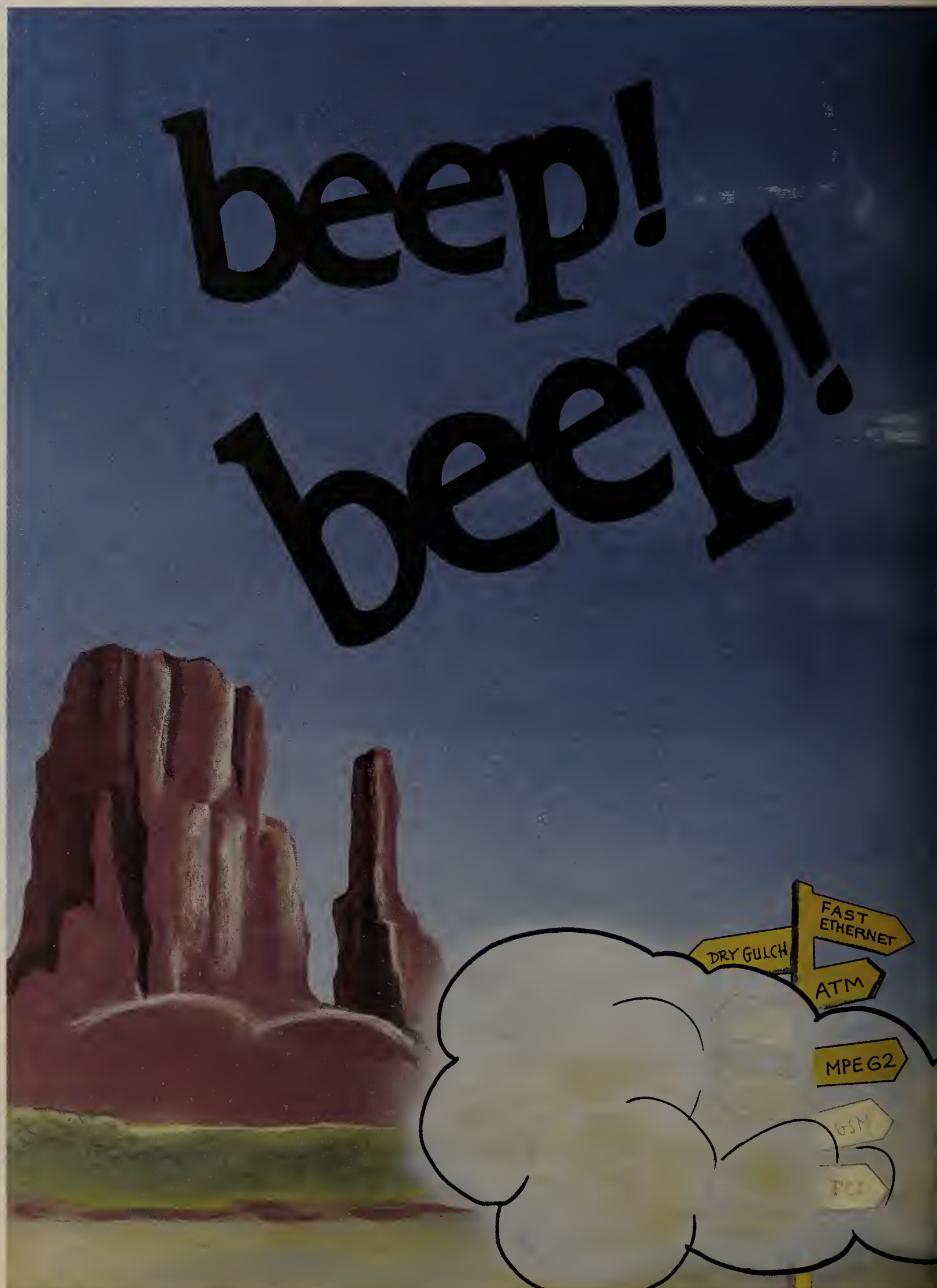
OpenV DAE will provide an object-oriented framework for OpenVision's OpenV OPSS platform, a suite of integrated systems management applications for controlling operations, performance, storage and security of networked computers. OpenV OPSS will be released later this month.

ObjectBroker will allow OpenV OPSS management applications to request services from other management application or objects without predefined access pathways or routines.

OpenVision will utilize ObjectBroker to provide a common set of object-based distribution services. These services include software installation and distribution, configuration management, a set of common collection services for event and policy management, and access to an enterprisewide object-oriented database for application storage and retrieval.

The company will provide a set of external adapter objects that let its system interoperate with other management tools, such as those based on the Simple Network Management Protocol and Common Information Management Protocol. Adapter objects are planned for SNMP-based systems, including Hewlett-Packard Co.'s OpenView, SunConnect's SunNet Manager and IBM's NetView/6000.

©OpenVision: (510) 426-6424.



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IBM

Continued from page 13

as failed or overloaded circuits.

The new NPM will also automatically learn the enterprise topology when it is powered up, so users no longer have to predefine devices and configurations to the NPM monitor.

"The overriding strategies with this NPM release was to improve the program's usability and to let users monitor as much of their enterprise from one screen as possible," Hall said.

IBM's DCAF 1.2 adds support for DOS and

Windows workstations, letting the help desk DCAF workstation control OS/2, DOS and Windows workstations from a central point.

DCAF is intended for managing remote workstations when expertise is unavailable at the remote site.

DCAF was also enhanced to support dial-in asynchronous services so any remote user can be reached via an asynchronous connection.

NPM 1.2 is available for MVS now and will be available for VM mainframes Jan. 28. Monthly license fees run from \$238 to \$1,465. DCAF 1.2 is available for \$180.

©IBM: (919) 301-5928.

DEC

Continued from page 13

access to OSI applications using a separate TCP/IP stack.

OSI addressing supports 160-bit addresses, allowing users to build networks that support millions of nodes. DECnet Phase IV supports 16-bit addresses, which limited networks to no more than 64,000 nodes.

The built-in network management utilities are intended to simplify installation, configuration and troubleshooting of DECnet/OSI net-

works, as well as to aid in the transition from DECnet Phase IV to DECnet/OSI.

The utilities include DEC's Network Control Language, Common Trace Facility, Event Dispatcher and CMIP Management Listener.

Network Control Language provides network managers with information on the performance of DECnet/OSI networks. It also allows managers to configure network parameters, and start-up and shut-down network components from a central management console.

Common Trace Facility allows users to collect and display information about protocol exchanges between different systems on the network. Event Dispatcher lets managers establish times at which certain network processes occur automatically, while CMIP Management Listener allows users to manage a DECnet/OSI network from any workstation on the network.

DECnet/OSI 2.0 for OpenVMS AXP is available now and ranges in price from \$1,116 to \$21,701.

©DEC: (800) 344-4825.

Pair

Continued from page 13

ers, enabling each company to service the other's products.

EXTENDING TCP/IP SUPPORT

Wellfleet's announcement of support for BGP across its router line promises to boost its performance when routing TCP/IP data as compared to the existing Exterior Gateway Protocol (EGP). BGP is an exterior gateway protocol that lets routing information be exchanged between border routers over a TCP/IP internet (see graphic, this page).

Unlike EGP, which requires a built-in transport mechanism to support large and frequent network broadcasts, BGP offers a simplified implementation using TCP as the transport protocol. BGP eliminates the need for periodic updates, retransmission, acknowledgement and sequencing as required in EGP.

BGP will be available in February as a free software upgrade.

Finally, Wellfleet also announced it has received Government Open Systems Interconnection Profile (GOSIP) Version 2 certification, meaning its routers have been deemed compatible with the latest version of GOSIP and enabling them to be listed on the federal government's register of approved products.

©Hughes: (800) 395-LANS or (415) 966-7300; Wellfleet: (508) 670-8888.

A TCP/IP protocol suite snapshot

Interior Gateway Protocol (IGP): Signifies routers that belong in the same routing domain.

Two types

- **Routing Information Protocol (RIP):** Route path selection between source and destination is based solely on the fewest number of hops.
- **Open Shortest Path First:** Path selection is more optimal, based on least-cost routing, load sharing and type-of-service routing. Aimed at replacing the older RIP.

Exterior Gateway Protocol (EGP): The glue that enables the various IGPs to exist independently, serving different autonomous systems. Uses a selected gateway to communicate information between different IGP routing domains.

Border Gateway Protocol: A newer, more robust exterior protocol that is aimed at replacing EGP. It eliminates the bottlenecks inherent in the earlier EGP.

SOURCE: FLOYD WILDER'S A GUIDE TO THE TCP/IP PROTOCOL SUITE
GRAPHIC BY TERRI MITCHELL

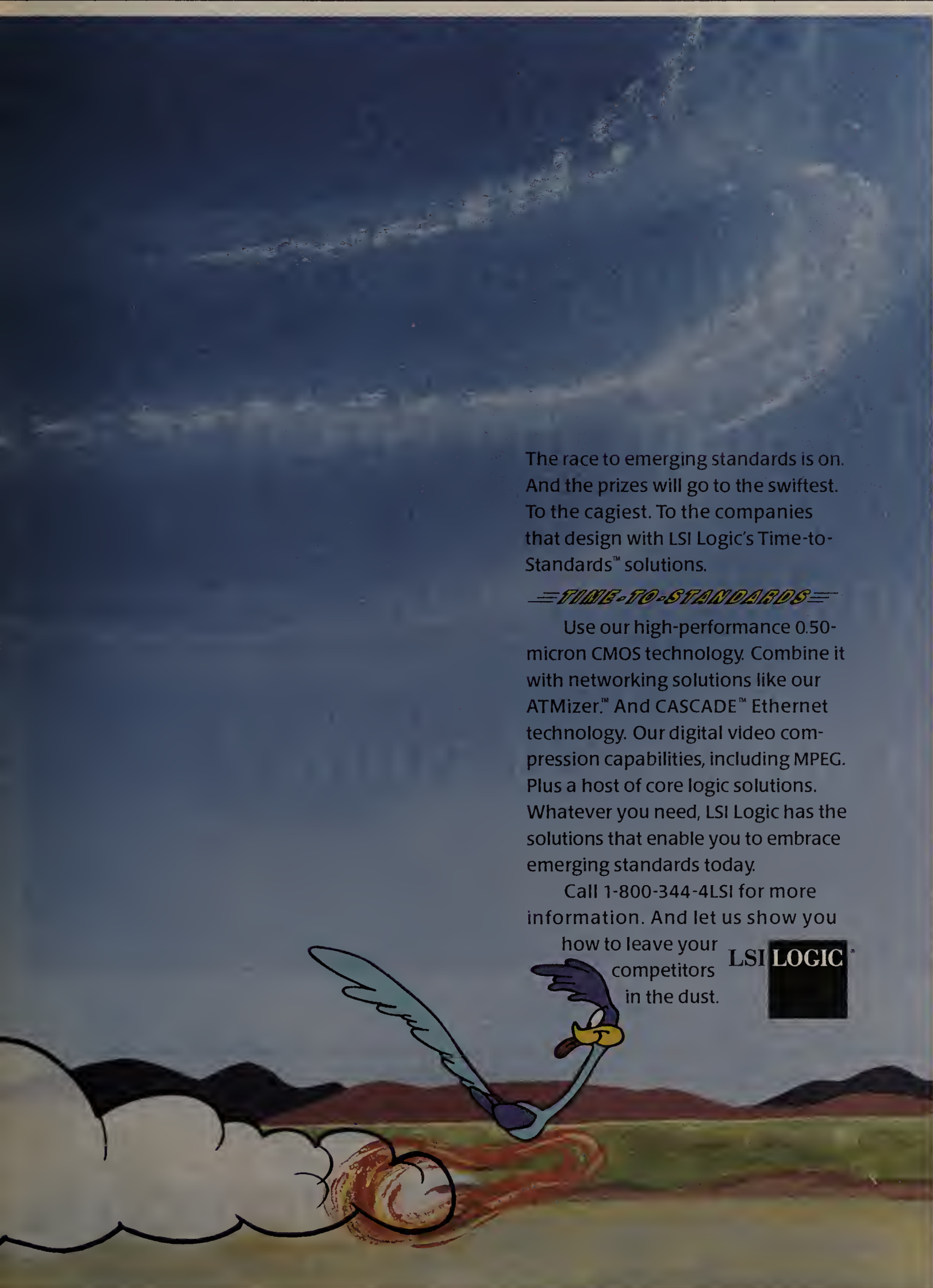
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BRIEFS

ITT Datacom, Compaq Computer Corp. and SysKonnnect, Inc., last week announced a turnkey high-speed network system supporting a variety of 100M bit/sec technologies, including Fiber Distributed Data Interface and FDDI over both unshielded and shielded twisted-pair wiring. The system will support applications including image processing, software engineering and desktop videoconferencing.

The ITT Structured Networking System (ISNS)-100 consists of ITT's unshielded twisted-pair cable, Compaq's ProSignia and ProLiant servers and Deskpro I and M workstations, as well as SysKonnnect's SK-5000 FDDI Workgroup Concentrators and SK-Net FDDI adapter cards for Industry Standard Architecture (ISA)-, Extended ISA- and Micro Channel Architecture-based workstations.

Kevin Johnson, director of North American operations at Santa Ana, Calif.-based ITT, said all ISNS-100 components are interoperable and based on industry standards. ISNS versions for 155M bit/sec Asynchronous Transfer Mode environments are under development, and ITT is evaluating various 100M bit/sec Ethernet schemes, as well. Pricing for ISNS-100, which is available now, depends on net configuration.

ITT: (714) 557-4700.

San Jose, Calif.-based Centrum Communications, Inc. last week announced a strategic alliance with Motorola UDS under which Motorola will incorporate Centrum's remote access technology in its product line. Motorola's new BitRUNline of remote network access communications servers developed by Centrum will offer telecommuters, mobile users and remote branch offices dial-up access to corporate enterprise networks.

Centrum: (408) 894-1800.

Chipcom Corp. has rolled out five products that support the IEEE 10Base-Fiber Backbone (FB) standard for running Ethernet traffic over fiber-optic cable. The new products are for large user sites that require fault tolerance.

The new product suite includes three modules for Chipcom's ONline System Concentrator intelligent hub, including a two-port module that offers configuration switching, which allows either port to be assigned to any of the hub's three Ethernet backplanes. There is also a four-port version of that module and a four-port module without configuration switching.

Available by year end, the two-port configuration switching module costs \$1,295, while the four-port version is tagged at \$2,395. The non-switching module costs \$1,800.

The Southborough, Mass.-based company will also offer two 10Base-FB transceivers by year end. Both devices offer a direct attachment unit interface connection to any 10Base-FB-compliant device, such as a wiring hub. The standard transceiver costs \$545. A fault-tolerant version, which includes a second port for redundant line connections and automatic switchover in the event the primary link fails, costs \$895.

Study reveals that while nets grow, LAN management budgets shrink

Revenue losses from LAN outages mount; spending on LAN mgmt. does not.

BY CARYN GILLOOLY

San Jose, Calif.

A network administrator's job has always been difficult, and according to a recent study, it isn't going to get any easier.

The Almighty Dollar



Infonetics Research, Inc., a research and consulting firm here, found that while the size of local-area networks and revenue loss due to LAN outages have increased, the management budget has lagged.

"Companies are still struggling with network and systems management — losing an estimated \$3.7 million in productivity and \$3.8 million in revenue annually" from network downtime, according to "The Real Cost of Network and Systems Management" study.

"[And] current management strategies will not scale — budget and staffing cannot keep

The average company loses \$62,500 in revenue per hour when a LAN server goes down.

pace with projected growth," the study states.

THEN AND NOW

An Infonetics study in 1989 focusing on LAN downtime found that user organizations lost \$4.15 million annually from network outages, far below the average \$7.5 million in annual losses cited in the 1993 study.

In addition, revenue losses from network outages have increased dramatically during the four years between studies from \$650,000 a year to \$3.8 million a year (see graphic, page 22).

According to the study, the increase in lost revenue provides insights into how LANs are being utilized in the marketplace. For example, the information shows that users are running critical business applications on LANs since, when the LANs go down, more money is being lost.

"In losses caused by LAN outages, the productivity loss is almost the same [as in the 1989 study], but the revenue loss is more than five times as high," said J'Amy Napolitan, market research director at Infonetics. "This means more mis-

sion-critical applications are being put on LANs, and there is an increased dependency on those LANs."

THE ANSWER IS...

It follows logically that as revenue losses due to LAN downtime mount, users would look to devote more resources to LAN and systems management in order to ensure that networks stay up. However, the study does not find

User organizations average 1.5 hours of downtime per LAN segment annually.

this was the case.

"The management budget [for people and equipment] is not going to grow as fast as the LAN segments will grow," Napolitan said.

For example, between 1993 and 1997, the number of servers on an enterprise net is expected to grow 170%, the number of desktops will grow 160%, and the number of LAN segments will grow 115%.

But the growth in systems and management budgets combined is just over 100%
See Study, page 22

LEGENT offers managed LAN backup and storage

BY CHRISTINE BURNS

Herndon, V.A.

LEGENT Corp. has unveiled storage management software that gives users a two-pronged approach to backup and recovery of local and remote LAN servers.

The company's Enterprise Storage Manager (ESM) lets users back up local-area network files on compressed disk storage units attached to servers while sending copies of those files over LU 6.2 links to mainframes equipped with tapes for storing hot spares of the data.

"We're covering all the bases for LAN-centric backup, storage and recovery," said Phil Carrai, vice president of LEGENT's resource management department. "With ESM, end users get quick access to all local backup files and individual LAN administrators can easily rebuild a downed server, while the mainframe storage element provides complete disaster recovery."

Files stored at the LAN and on the mainframe are retrievable by end users via client software from LEGENT that features a

graphical user interface.

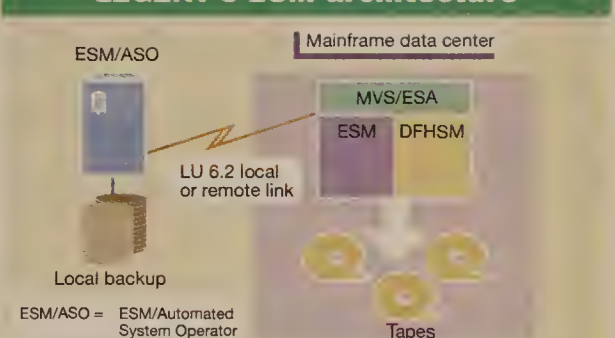
The ESM software, which resides on both mainframes and servers involved in the backup process, uses a data compression technique called binary object technology to conserve space on the local magnetic disk units and decrease the amount of data being sent over a network from file servers to a mainframe.

Binary object technology is used by one or more file servers to ensure that duplicate files are not needlessly backed up and stored. ESM keeps a directory of all backed-up files, Carrai said, adding that LEGENT is pursuing a patent for its compression technology.

Backup and storage policies for both local and remote LANs can be defined by system administrators via a management console attached to the mainframe. An administrator can define how often the LAN is backed up, Carrai explained.

The automated systems operator (ASO)

LEGENT's ESM architecture



LEGENT's Enterprise Storage Manager (ESM) software runs on both the mainframe, where it works with IBM's Distributed File Hierarchical Storage Manager (DFHSM), and on LAN servers to provide server backup and recovery.

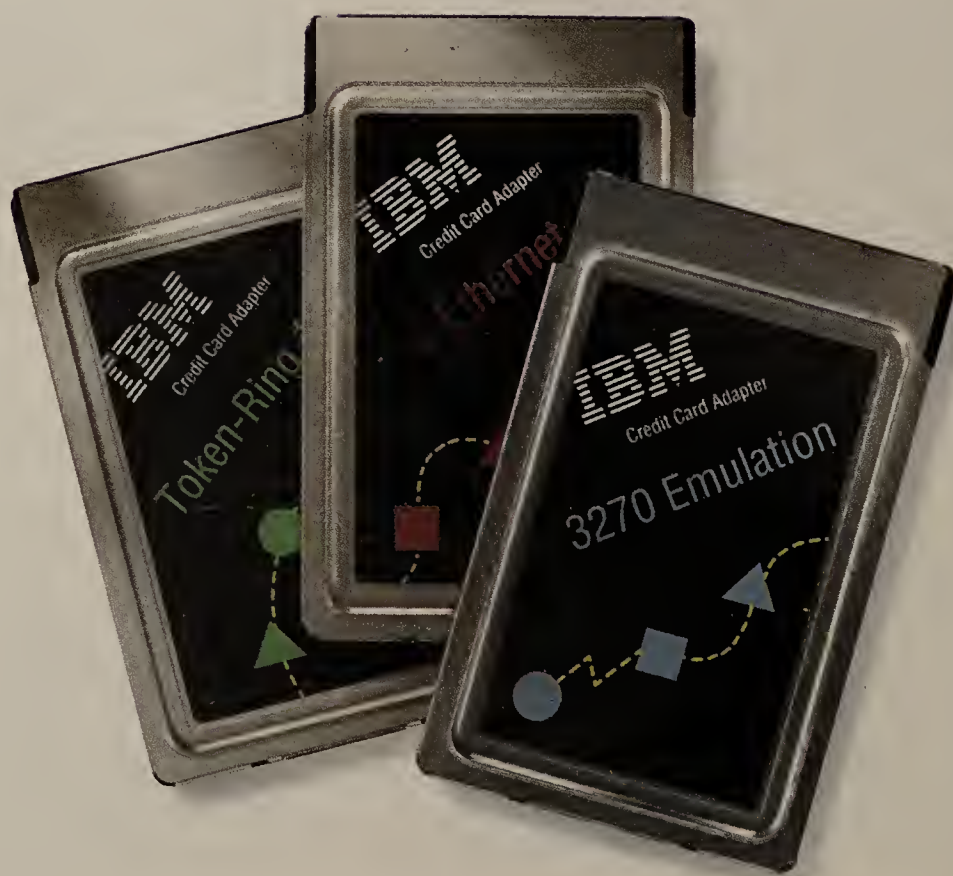
GRAPHIC BY TERRI MITCHELL

SOURCE: LEGENT CORP., HERNDON, VA.

facility — which is software sitting on a server at each LAN — implements the storage management rules. In addition to allowing for central backup and storage management from the mainframe, the ASO facility can be configured to let a local network administrator control the backup policies of each LAN.

ESM will be available in a controlled release this month, with general availability set for April. The initial release only supports OS/2-based LANs running IBM's LAN Server or Microsoft Corp.'s LAN Manager. LEGENT plans to support Novell, Inc.'s
See LEGENT, page 59

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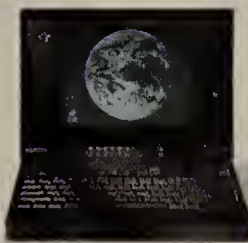
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*ThinkPad 350C (486SL/25
MHz processor, 1 PCMCIA slot)*

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IBM

Microcom readies its assault on the remote access market

BY SKIP MACASKILL

Norwood, Mass.

Microcom, Inc. this week will announce a new access server and complementary Windows-based client software designed to let remote users tie into corporate local-area networks.

The company's new dial-in/dial-out LANexpress system will enable remote users to control resources on a corporate LAN while simultaneously running local applications.

The new offering targets the fast-growing remote access market, which will consist of 25 million users in two years and generate \$3 billion in revenue by 1997, according to Forrester Research, Inc., a consultancy in Cambridge, Mass.

The centerpiece of LANexpress is the LANexpress Server, which combines access routing capabilities with integrated V.fast modem functionality, as well as an Ethernet or token-ring interface. The server resides on a corporate LAN and can be outfitted with two, four or eight wide-area network ports.

Remote clients, which can include individual mobile nodes for traveling salespeople or business travelers, gain access to the corporate LAN through the LANexpress Server. The remote clients are loaded with LANexpress Remote, Windows-based remote access software that allows a user to log on to and control a device on the corporate LAN while running local applications in the background.

This dual capability allows remote users to avoid exiting a Windows application, for example, to dial in to the corporate LAN through a DOS communications command.

The LANexpress Remote software works with more than 200 modem models, giving remote users

many options for dialing in to the LANexpress Server. Microcom's DeskPorte Fast and TravelPorte Fast modems can be used, for example, to dial in to a corporate LAN at rates of up to 115.2K bit/sec.

In order to manage this end-to-end connection, Microcom is offering its Windows-based ExpressWatch net management software, which runs on any Intel Corp. 80386-based personal computer on the corporate LAN.

Both LANs and wide-area networks can be monitored and configured from this console, enabling net managers to isolate faults and fine-tune the remote access network. Statistics are provided for call accounting, capacity planning and department chargebacks.

According to Mike Reed, director of product marketing of LAN access products at Microcom, the LANexpress system allows users to avoid the performance bottlenecks associated with remote communications.

"Most applications have been designed for multi-megabit LAN environments, not for standard telephone or cellular connections," he said. "LANexpress eliminates many of the bottlenecks because it uses a high-performance server architecture, high-speed V.fast modems with parallel ports and enhanced remote user software drivers."

All system components will be available this month. LANexpress costs between \$3,499 and \$7,999, depending on configuration. That price includes LANexpress Server, ExpressWatch and an unlimited number of licenses for Carbon Copy, Microcom's remote control software. The LANexpress Remote software costs from \$25 to \$50 per copy.

©Microcom: (617) 551-1000.

Study

Continued from page 19

(see graphic, this page).

The discrepancies between these figures will force many users to implement tools that automate network and systems management as much as possible, according to the study.

"Companies will need to handle problems not with people, but with tools," Napolitan said. "And you'll need higher end tools that will be able to troubleshoot more things."

POSSIBLE TOOLS

Implementing intelligent wiring hubs will help the situation. "Intelligent hubs have greatly simplified many LAN management tasks such as adds, moves and changes," the study says.

Remote management will also be key to solving the management crunch.

"Too many management tasks are still performed at the problem site," the study says, adding that traveling to and from these sites — in addition to the time it takes to solve the problem — chews up too much of the administrator's time.

Remote tools could help save time as well as money, the study says.

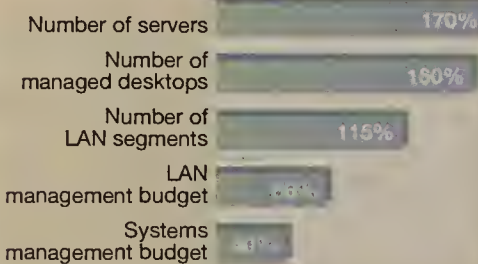
Finally, users should call on vendors to produce products relying on artificial intelligence and that suggest solutions to problems.

"Management tools and applications that offer insight into the actual management process are critical for the manager seeking to understand the environment," the study says.

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How will your network grow?

Average percentage of change (1993-1997)



Figures are based on a survey of 106 LAN and computer system managers.

SOURCE: INFONETICS RESEARCH, INC., SAN JOSE, CALIF.
GRAPHIC BY TERRI MITCHELL

The rising cost of LAN downtime

1989

Productivity loss = \$3,500,000
Revenue loss = \$650,000
Total loss = \$4,150,000

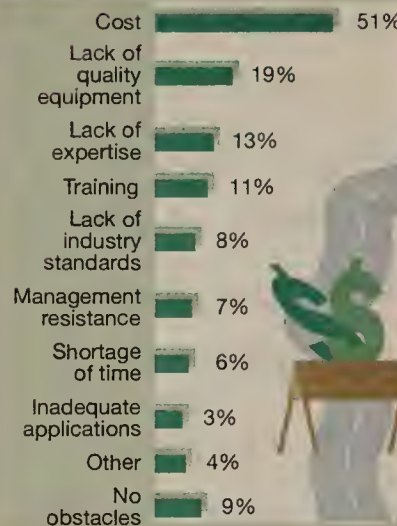
1993

Productivity loss = \$3,700,000
Revenue loss = \$3,800,000
Total loss = \$7,500,000

While productivity losses due to network downtime have increased only slightly over the past 4 years, revenue losses due to network downtime have more than quintupled as users move mission-critical data onto LANs. Findings are based on a survey of 106 LAN and computer system managers.

SOURCE: INFONETICS RESEARCH, INC., SAN JOSE, CALIF.
GRAPHIC BY TERRI MITCHELL

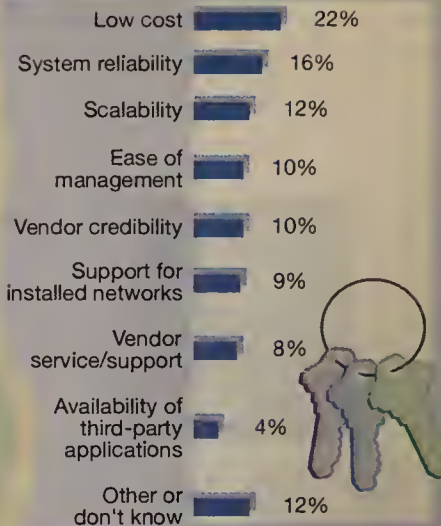
Multimedia roadblocks...



Findings are based on a recent survey of 305 early adopters of multimedia technology.

GRAPHIC BY TERRI MITCHELL

...and key purchase factors



SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

Picture this: Novell brings video to the LAN

NetWare Video enables existing NetWare nets to access multimedia server files.

BY CARYN GILLOOLY

Boston

Novell, Inc. last week made its foray into the multimedia market with the release of NetWare Video 1.0.

NetWare Video is a NetWare Loadable Module (NLM) that allows as many as 24 users to simultaneously access, store and manage digital video and audio files residing on a NetWare server.

The new software will enable users that now rely on CDROMs and other technologies for multimedia applications to use their existing NetWare networks to access both multimedia clips and other NetWare services.

"NetWare Video provides a practical solution to customers' increasing demand for business video applications that maximize their existing investments in NetWare and networked applications," said Neil Ferris, vice president and general manager at Novell's Multimedia Products Division, which was formed following Novell's recent acquisition of Fluent, Inc. in Natick, Mass.

"NetWare Video lays the groundwork for widespread multimedia deployment."

MULTIMEDIA MANIA

As an NLM, NetWare Video can run within a NetWare 3.1X or 4.X environment on the NetWare server or on a dedicated multimedia server running NetWare Runtime. The software runs over all network topologies supported by NetWare, including Ethernet, token-ring and Fiber Distributed Data Interface.

Because of the inherent bandwidth limitations of most local-area networks — and in an effort to support large numbers of users — NetWare Video provides synchronized audio/video playback using scalable packet video technology.

The NLM uses this technology to send audio and video streams across

the network separately and then unite them at the desktop.

Each user that needs access to the multimedia clips on a NetWare server must have a sound card, speakers and a decompression package, such as Intel Corp.'s Indeo, at the workstation. The initial version requires users to run Windows on Intel 80486-based computers, but Novell executives promised that Apple Computer, Inc. Macintosh support is coming soon.

Users responded enthusiastically to running multimedia applications on NetWare.

"Our college puts images of complex research data into high-definition videos that are stored on network servers and then viewed from a researcher's desktop PC," said Bruce Marler, technology assessor/systems integrator at the College of Oceanic and Atmospheric Sciences at Oregon State University, a beta site for the NLM.

"NetWare Video addresses the tough issues we have experienced in implementing video technology on a network."

THREE-PHASE ROLLOUT

The NetWare Video NLM is the first of a three-part multimedia strategy under way at Novell, according to Richard King, executive vice president of Novell's NetWare Systems Group.

The next phase, he said, will be one-to-many live video, where one person is "broadcasting" to several end-user workstations.

This capability should be available in the second half of 1994.

The third phase will provide full-duplex desktop videoconferencing for multiple users. King did not say when the firm will deliver products in this area.

NetWare Video 1.0 is available now in five-, 10- and 25-user versions for \$1,100, \$1,990 and \$2,975, respectively.

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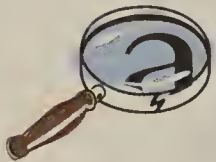
This is a story about a small computer engineered to be so dependable, you won't think twice about trusting it with your mission-critical applications. And to be this without filling a closet,

much less a room. If you haven't

thought of Compaq as an enterprise-critical platform before, we invite

you to grab your bifocals and

begin. (We'll be cramming a lot of information into this ad, which, given how much we managed to fit into our new servers, only makes sense.)



If there's one thing we've learned working with our customers, it's that you're running more and more mission-critical applications on your network. And if your network goes down, your business goes down. All of which makes the introduction of the new Compaq ProLiant Server even more timely.

The ProLiant is a new family of affordable, high-performance, easy-to-manage servers engineered specifically to provide the high availability you need for mission-critical networks. We've designed ProLiant in three different models, ranging from a single-processor configuration to a four-Pentium processor model.

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with, there's Full Spectrum Fault Management, provided by Compaq

Insight Manager technology and

software that continually monitors over 800 aspects of the server's operating status. (For example, Drive Parameter Tracking checks 15 hard-drive parameters.) All of this information is constantly gathered, analyzed and then used to prevent, tolerate or recover from system problems.



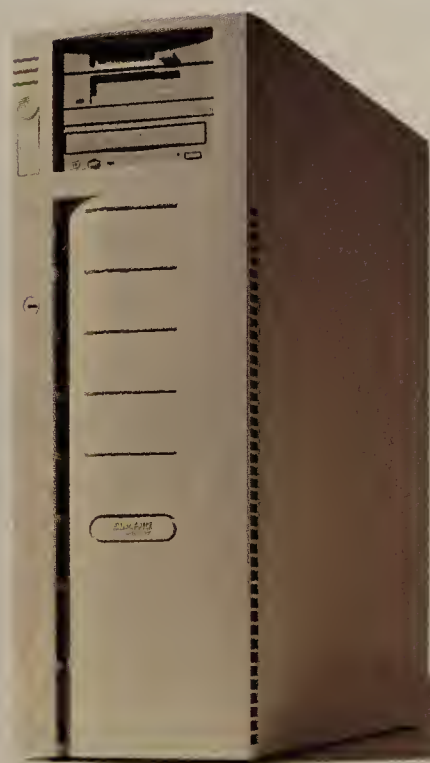
If the performance of a monitored component drops below a specified level, our unique Pre-Failure Warranty kicks in. We'll actually replace a Compaq warranted drive or memory system free. Before it stops working. No downtime. Ringing cash registers. Happy boss.*



Still, no network's perfect. In the unlikely event problems occur, our server exhibits remarkable tolerance. Every ProLiant includes Compaq-designed hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots

automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

VER IS A MAINFRAME WITH AN ATTITUDE.



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All in a surprisingly small box for not a whole lot of money. In fact, a DX2/66 Compaq ProLiant 1000 starts at about \$6000‡.

Which may help to explain the look your boss gives you when he hears how much money you've saved: stunned admiration. But you'll get used to that. It goes with the territory. For more information on the new



Compaq ProLiant servers, or for the location of an authorized Compaq reseller near you, just call us at 1-800-345-1518. If you'd like to receive model, feature and specification information immediately via fax, select the PaqFax option. Or, if you'd like that information even sooner, just turn the page.

COMPAQ



THE NEW COMPAQ PROLIANT MISSION-CRITICAL SERVERS

ProLiant 1000

ProLiant 2000

ProLiant 4000

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<i>Processor</i>	Intel 486DX2/66 or Pentium 60MHz	Intel 486DX/50 or Pentium 66MHz	Intel 486DX/50 or Pentium 66MHz
<i>Architecture</i>	TriFlex/PC One Processor	TriFlex with up to two symmetric processors	TriFlex with up to four symmetric processors
<i>Network Interface</i>	Up to 12 High-Speed Channels; NetFlex 2 with Packet Blaster Technology Standard		
<i>Standard Disk Controller</i>	Integrated Fast SCSI-2 and Smart SCSI Array Controller (selected models)		
<i>Storage Capacity</i>	550MB–112GB Internal/external	1050MB–140GB Internal/external	1050MB–140GB Internal/external
<i>Typical Usage</i>	Departmental network services—primarily NetWare	Departmental network application services—NetWare, NT and Unix	Application services for preemptive downsizing—NT and Unix
<i>Transaction Rating</i>	50–150 TPS	200–300 TPS	300–400 TPS
<i>Estimated Starting Street Price[‡]</i>	\$6,000	\$8,900	\$13,900

SERVER DEPENDABILITY AND AVAILABILITY

<i>Management</i>	Second-generation Compaq Insight Manager (standard) combines with innovative hardware design to constantly monitor, assess and report server health and performance
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COMPAQ

by Mark Gibbs

Let the media take care of itself

In looking through the computer trade journals, one thing that stands out is the huge market for network media. It seems that almost every other article is about switches, routers, wireless networking or some other advance.

Typically, these media infrastructure products tout performance and manageability as key features.

PERFORMANCE A MUST

Now performance is a definite need. With network-based multimedia, document imaging and databases, we need every bit of performance we can afford to get our hands on.

But media management? It sure sounds good when you read the ads or stories. There are management systems that allow you to monitor network use, trap errors, capture alerts from hubs and detect a million conditions. They offer sophisticated displays and extensive data logging.

What is missing from all of this enthusiastic

hyperbole is the notion that media infrastructure really should be invisible. To users, media is largely invisible. But to the poor support technicians, media is almost as big an issue as any other component of the network system.

If technicians were driving a car, all they'd have to do is watch the speedometer, the gas gauge and the temperature gauge. But put them behind a network management system and they get gauges, dials, levers, baton twirlers, a marching band and motorcycle outriders.

When it comes down to it, people who manage and use corporate networks don't care about the amount of packets lost and framing errors. It's like traveling down the freeway and having to analyze every bump and pothole. You pay attention when there are enough of them, but you ignore them when there are only a few. This is the way it should be with network media.

You want to set up a network connection? Plug the cable from the user's desktop into a hub, set the configuration (this should be

optional, as it should be self-configuring) and then ignore the media. If there's a real problem — the network equivalent of too many potholes or a road closure — the system should tell you there is a problem and that it has been automatically corrected.

At present, the data you get from most media management systems is overwhelming. It's presented to you as if you really need it and as if you should know about it in-depth.

You have to solve a net media problem? The system should suggest a cause and a solution or, better still, fit it. The system should not stun you with data.

AN EXPERT OPINION

Whatever happened to expert systems technology? All of these rules-based systems were supposed to take the kind of raw data we get from media diagnostics, analyze it and offer prescriptions for correcting problems.

With very few exceptions, expert systems technology has made little impact on networking and the management of media infrastructure. Instead, volumes of raw data are offered as if they are a solution.

This is curious in that there are many developers' kits that make embedding rules-based analysis technology into applications easy. Yet what we are offered as network management tools are dumb, data gathering systems promoted as the latest technology.

If your company is investing heavily in

network media monitoring and analysis tools, be careful. The effort you're expending to get the whole mess instrumented and to train your staff to understand the output — in addition to the cost — will eventually become wasted.

Near term, you should expect — indeed, you should demand — to have smart network media or smart diagnostic systems. Managing the network infrastructure should be as transparent as driving a car.

When the net has problems, it should at least give you an analysis and suggest solutions, rather

than bury you in raw data.

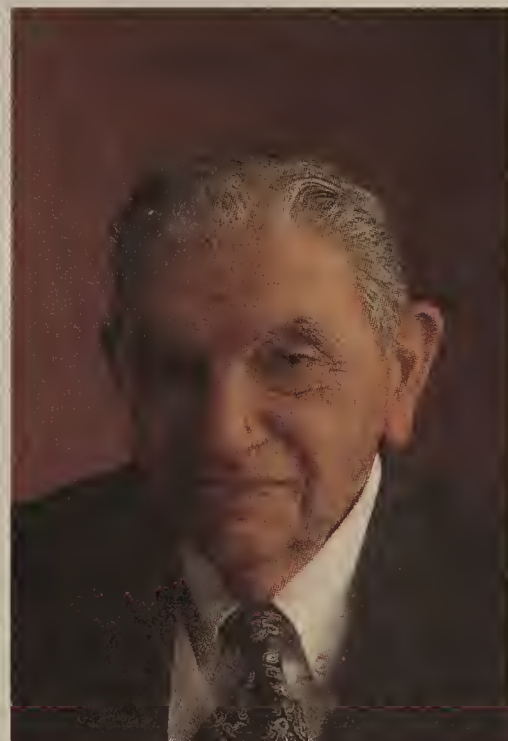
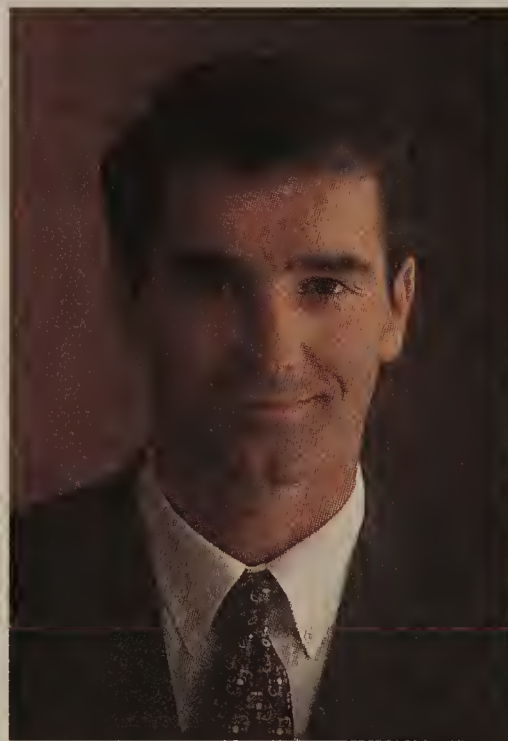
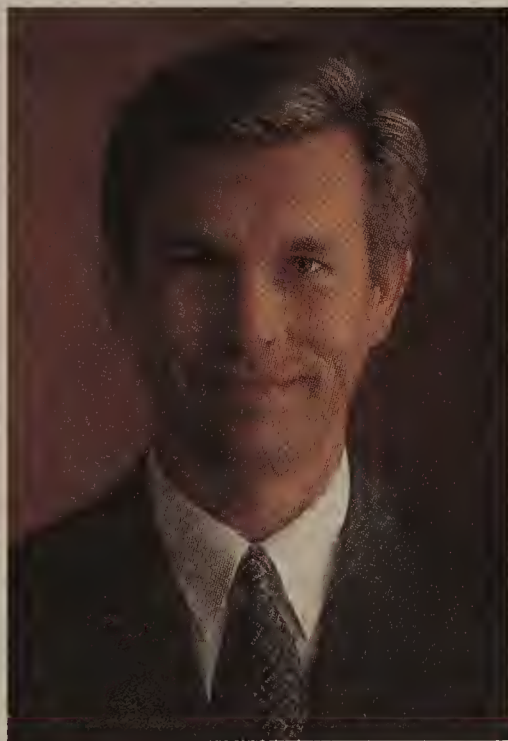
So if vendors offer you systems that provide data on the media infrastructure beyond your wildest dreams (or should that be nightmares?), you are probably buying into technology that is well behind the leading edge.

Look for smart and transparent solutions that let the media infrastructure take care of itself.

♦ Gibbs is a writer and consultant based in Ventura, Calif. He can be reached at (805) 647-2307 or on the Internet (mgibbs@rain.org).

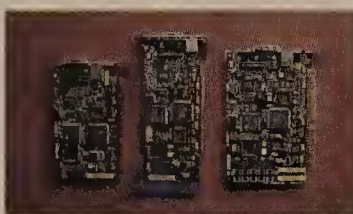
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Bell Atlantic Facilities Management Service

Range of monthly charges per DS0 channel

Feature	Monthly rate	3-year contract	5-year contract
Channel termination*			
Electrical	\$4.91-\$5.46	\$1.51-\$4.02	\$0.93-\$2.83
Optical	\$4.37-\$4.91	\$1.24-\$3.72	\$0.74-\$2.23
Mileage fees			
Fixed fee	\$4.28	\$3.86	\$3.31
Per mile	\$0.68	\$0.54	\$0.38
Multiplexing			
DS3/DS1	\$0.78	\$0.78	\$0.78
DS1/DS0	\$7.58	\$7.58	\$7.58
Administration	\$0.50	\$0.50	\$0.50

*Charges range according to number of DS0 channels ordered, with price breaks for every 672 DS0s ordered (the number of DS0 channels derivable from a DS3 circuit).

SOURCE: BELL ATLANTIC NETWORK SERVICES, INC., ARLINGTON, VA. GRAPHIC BY SUSAN J. CHAMPENY

Bell Atlantic challenges CAPs on special access

BY BILL BURCH

Austin, Texas

Bell Atlantic Corp. last month began offering a new service that lets large corporate users save money on special access links to a long-distance carrier's point of presence (POP) by using only as much bandwidth as they need.

Special access allows users to bypass the local switched network for direct access to a long-distance carrier. With Bell Atlantic's Facilities Management Service (FMS), high-volume users can buy access to a long-distance carrier's POP in DS0 increments of 64K bit/sec each instead of leasing entire T-3 links, much of which may go unused.

Users still need T-3 access to the Bell Atlantic central office but are charged only for the actual DS0s used between the central office and the long-distance carrier's POP. However, Bell Atlantic plans to scale the offering down to DS1 access in May 1994, said Michael Daly, advanced services product manager for Bell Atlantic Carrier Services.

With the service, users pass off to Bell Atlantic the responsibility for managing the voice and data link from the central office to the POP. The carrier handles such details as multiplexing traffic to reduce the number of lines needed and adding lines for added traffic.

The service can be set up in 45 days, but network reconfigurations thereafter are instantaneous. Bell Atlantic will not be charging for adds and drops of DS0 circuits, allowing more flexibility in configuring connections to appropriate levels. And to tempt users to try the service, Bell Atlantic is waiving termination charges for the next 18 months.

The carrier believes its FMS will shape up as a solid response to the bypass offered by competitive access providers (CAP). "FMS addresses the challenge that competition has put forth in the marketplace in terms of added value and additional service and price," Daly said.

Ryan James, a director with The Yankee Group consultancy in Boston, said he believes that users

See CAPs, page 30

Unifi travels rough road from product announcement to early use

Vendor, beta sites endure prolonged product tests, many patches.

BY BOB WALLACE

Billerica, Mass.

A package announced in mid-1991 that promised to change the way network managers build call centers is just now shipping after a long development cycle plagued by equipment compatibility problems.

Telequent Communications Corp.'s PhoneServer is client/server software that enables multiple Unix machines to function as an automatic call distributor capable of shipping calls and caller data to agents at far-flung call centers.

But Telequent, which until last month was known as Unifi Communications Corp., had problems getting its product to work over Integrated Services Digital Network Basic Rate Interface (BRI) lines with AT&T Network Systems and Northern Telecom, Inc. switches equipped to support ISDN.

That produced major problems because PhoneServer uses ISDN's D signaling channel to route calling data from a Unix machine on the customer's premises to switches in local carriers' nets.

Unifi founder Robert Pokress acknowl-

edged that PhoneServer had problems communicating with ISDN-capable central office switches but declined to provide specifics of the problem. The company had planned to make the product generally available in late 1991, he said, but did not start shipping it until earlier this year (see graphic, this page).

EARLY USERS

One company that beta-tested PhoneServer said it encountered no problems with the system because Unifi anticipated problems and kept providing fixes.

"They realized they were falling behind their schedule and kept providing software upgrades," said Don Stover, manager of systems products administration operations for Xerox Corp. "We asked them why all the upgrades were needed and all they mentioned were 'reliability issues.'"

The company provided excellent technical support, Stover said, and also brought in a new vice president of software engineering to get the product back on track.

Xerox has decided to stick with PhoneServer, and uses the offering to allocate incoming calls among three facilities in the Rochester, N.Y., area: its corporate headquarters; a 38-person telemarketing unit; and a four-person human resources group. The firm is considering using PhoneServer to route calls to two other sites.

"We looked closely at other call distribution systems, but all we saw was a bunch of

antiquated and unreliable products," Stover said. "The Unifi product was, and still is, the most advanced [call distribution system] out there."

"The Unifi product was, and still is, the most advanced product out there," Don Stover said.

Some say the future of PhoneServer is uncertain, largely because the system only works with ISDN BRI lines, which are

anything but ubiquitous and vary widely in price.

"The need for ISDN BRI lines will limit use of the system to some extent," said Mark Langner, a senior analyst with TeleChoice, Inc., a Verona, N.J., consultancy. "People will use it in states where ISDN is inexpensive, like California."

THE INNER WORKINGS

PhoneServer comprises three components: Controller; Manager; and Client software programs.

Controller software can run on any Unix-based computer that can support an ISDN BRI line to an ISDN-equipped AT&T 5ESS or Northern Telecom DMS-100 central office switch. The software enables the processor to exchange call routing information with an ISDN central office switch over the

See Unifi, page 59



BRIEFS

The U.S. Supreme Court last week said it will hear appeals from MCI Communications Corp. and the Department of Justice on arguments that the Federal Communications Commission should be allowed to make tariff filings optional from nondominant carriers.

Last July, the U.S. Court of Appeals declared that the FCC's forbearance policy on tariff filing was contrary to federal law, thus forcing the FCC to require all carriers to file

tariffs.

Meanwhile, the U.S. Court of Appeals for the District of Columbia has turned down an AT&T request for a stay on the FCC's decision to allow non-dominant long-distance carriers to file tariffs listing only ranges of rates. The court is currently considering an AT&T appeal of the FCC decision; the long-distance carrier is asking that its competitors be required to spell out the particulars of their service offerings.

MCI Communications Corp. has received contracts to provide network services to Cardinal Distribution, Inc. of Dublin, Ohio, and Upgrade Corporation of America in Buffalo, N.Y.

Cardinal Distribution signed a three-year, \$3.6 million contract for outbound, toll-free and audioconferencing services for its headquarters and 14 other locations nationwide.

Upgrade Corporation signed a three-year, \$1.8 million contract for outbound, toll-free and data services at its headquarters.

New Federal Communications Commission Chairman Reed Hundt last week announced that Blair Levin was named Hundt's chief of staff. Levin, formally a partner with Parker, Poe, Adams and Bernstein, a Raleigh, N.C., law firm, practiced both communications transactions and state and local government finance work.

Hundt also appointed a pair of special assistants, drafting Karen Brinkmann from his old law firm, Latham & Watkins, and Merrill Spiegel, formerly legislative director for Rep. Rick Boucher (D-Va.)

INTERNET COMPETITION

Sprint to boost its IP backbone from T-1 to T-3

BY ELLEN MESSMER

Washington, D.C.

Early next year, Sprint Corp. will upgrade its SprintLink Internet Protocol network from T-1 to T-3 to accommodate a growing roster of customers and to prepare for changes imminent on the government-funded portion of the Internet.

By boosting the SprintLink backbone speed to T-3, Sprint will have plenty of bandwidth available to satisfy new demands. Among the first users will be companies involved in a manufacturing project just getting under way in the Midwest that will ship computer-aided design and manufacturing files over the SprintLink network.

And Sprint will be ready for action when the National Science Foundation (NSF) next spring ends the subsidy it pays to Advanced Network & Services, Inc. (ANS) for the T-3 Internet backbone service ANS now provides.

At that time, a new era of competition will begin. The NSF will dole out funds directly to regional Internet providers instead of subsidizing ANS, which regional Internet providers typically use today for backbone services. With funding from NSF, the regional providers will be free to buy backbone IP services from whatever source they choose. It is not yet clear how many providers may crop up, but Sprint is positioning itself to be one.

"Our job now is to replace ANS as the foremost IP backbone provider," said Bob Collet, Sprint's director of Internet services and systems. Sprint is fielding inquiries from several regional providers such as WestNet, run by the University of Colorado, which have been shopping around for alternatives to ANS.

Nearly two years in service, SprintLink now has about 100 customers, ranging from retailers to government networks to local-service providers, Collet said.

Sprint offers IP access from 9.6K bit/sec to T-1 from its 300 points of presence nationwide and also provides connections to Japan, Moscow and several

European points. As part of the larger Internet, Sprint can hand off traffic to the numerous regional network providers and federal agencies, as well.

Its current T-1 backbone is based on IP switching nodes in Chicago, Fort Worth, Texas, Stockton, Calif. and Washington, D.C. Sprint will soon deploy Cisco Systems, Inc. 7000 routers at those four nodes and connect them with T-3 links.

Reasons other than competition with ANS lead Sprint to believe more bandwidth will be needed. Under a federal contract awarded to a manufacturing consortium that includes Allied-Signal, Inc. and Man-

Tech, Inc., Sprint will provide as many as 5,000 small and midsize businesses in the Midwest with SprintLink services.

The consortium, which is part of the Clinton administration's Technology Reinvestment Program, hopes to wean smaller manufacturers from dependence on defense-related manufacturing. The group will provide the Midwestern regional manufacturing centers run by the Department of Commerce with Internet connections, and set up X.500

Directory Services with business and technology information the manufacturers may want.

The consortium will also provide direct access to machines that produce product prototype models from CAD/CAM designs. Companies that cannot afford these expensive rapid prototype modellers will be able to lease time on the machines and use the Sprint network to feed them design data.

As a subcontractor to Sprint, Austin, Texas-based Microelectronics and Computer Technology Corp. (MCC) will be refining an electronic remittance application it has developed that allows secured, encrypted electronic funds transfer over public IP networks, rather than private circuit-switched nets as is the case today.

"We're working to provide [electronic funds transfer] capabilities in an open network," said Ken Fiduc, director of engineering at MCC. ☐

Sprint will provide as many as 5,000 small and midsize businesses in the Midwest with SprintLink services.

CAPs

Continued from page 29

want to reduce the telecommunications management burden but will not wind up relying on the local exchange carriers.

"Bell Atlantic is trying to recapture a segment of the market that's long since been lost," James said. "Most large corporations view their interexchange carrier as their value-added supplier, and the local exchange carrier . . . is just providing the last-mile commodity item called access."

However, Steve Sazegari, an analyst with Ryan, Hankin and Kent in South San Francisco, said he thinks the service can help save users money.

"In the next two to three years, we will see most of the telephone companies in the major metropolitan areas provide special access that has the capability for bandwidth on demand," Sazegari said.

The service is available in Pittsburgh and Washington, D.C., but Bell Atlantic plans to roll it out across its 19 local access and transport areas, Daly said.

Bell Atlantic has priced the DS0 links so that the crossover point for current T-3 users is roughly 15 T-1s for users with a five-year contract. That is, if a firm rents a full DS3 pipe but only uses 15 of the 28 DS1 channels, it is less expensive to sign up for FMS.

To use the service, customers must agree to sign up

all their primary locations within a LATA. That will lock out CAPs from providing special access.

The rule may succeed in denying market share to the CAPs, but it could hurt customers. FMS does not support alternate serving central offices, meaning each office would be tied to a single serving wire center without backup connections from an alternative access provider. The service does provide for alternate routing once traffic has entered the carrier's net.

The carrier will have alternate access available over Synchronous Optical Network rings next year.

FMS' cost savings for DS3 users is its main benefit, according to Chris Finn, a senior analyst with TeleChoice, Inc., a Verona, N.J., consultancy. Finn discounts the service's network management features as uninteresting and said Bell Atlantic's intention is to dominate special access traffic. "Don't even think about splitting your traffic," is Bell Atlantic's message, he said. "Go for a DS3 pipe to us; we'll make it worth your while." But users should still consider CAPs for their flexibility, he added.

☎Bell Atlantic: (800) 999-1210.

Comments

To comment on this or any article, drop us a fax at (508) 820-3467, call (800) 622-1108, Ext. 487, or message us via Internet at network@world.std.com.

RATE & TARIFF MONITOR

by David Rohde

Nynex gets creative in face of FCC ruling

With competitive access providers (CAP) scouring the island of Manhattan for its best customers, New York Telephone Co. isn't letting the old regulated-utility mindset stop it from responding.

The telephone company's innovative Enterprise Services offering gives a good illustration of how the increasingly beleaguered Bell operating companies may respond to competitive pressures in the nation's biggest markets.

And when the FCC recently threw a legal hurdle in the way of Enterprise Services, New York Telephone's parent Nynex Corp. showed an interesting response to solve the problem — at least from a tariff perspective.

Enterprise Services constitutes a web of private-line offerings with bandwidth on demand and lickety-split network reconfiguration services. The package is based on the telephone company's arrangement with Newbridge Networks, Inc. in Herndon, Va., for intelligent channel banks at customer premises (NW, Nov. 8, page 4).

For point-to-point service within New York City, Enterprise customers incur charges for Digital Distribution Channels (DDC) between customer premises and the telephone company's central office. Then they incur charges for Interoffice Channels (IOC) between New York Telephone companies that support this package.

For T-1 lines, DDCs cost \$245 per month, while the IOCs cost \$99 fixed plus \$27 per mile per month. An additional \$27 per month buys you dual homing — a diversity option that allows routing to an alternate central office.

For 64K bit/sec DS0 channels, DDCs cost \$72, while IOCs cost \$13 fixed plus \$3 per mile per month. Nine more bucks gets you dual homing. Discounts are available for two- to five-year term deals, and bandwidth on demand is available at rates such as \$31 for eight hours per month of 256K bit/sec usage.

To let users employ Enterprise Services for access to interstate long-distance services, Nynex filed an FCC tariff with an analogous cost structure. Here the numbers look slightly higher.

Take T-1 channels for interstate access. Instead of a DDC, there's a "channel termination" charge of \$275 per month. And instead of an IOC, there's a "channel mileage" charge of \$110 fixed plus \$30 per mile per month.

For DS0 channels, the channel ter-

mination charge actually depends on the network interface — from \$54 per month for analog two-wire connections to \$80 per month for digital interfaces. The channel mileage runs \$15 fixed and \$3.50 per mile per month.

But then the Newbridge arrangement was called into question.

Although the FCC had originally allowed New York Telephone to bundle

Enterprise Services with Newbridge multiplexing equipment, other manufacturers complained and the commission ordered the telephone company to unbundle the offering. Nynex quickly responded with an FCC tariff revision.

But Nynex didn't simply eliminate Newbridge and say, "Get your own." Instead, Nynex now says Enterprise Services DS0 channels are available in

two configurations: Standard Service and Prime Service.

Under Standard Service, the telephone company still deploys its own network equipment — that is, Newbridge multiplexers — but at a location other than the customer's premises, such as in the basement of a user's building. As long as the equipment is not on the customer's premises, it is not considered bundling.

Under Prime Service, the customer provides its own equipment, but it must meet specifications contained in a referenced Newbridge technical release.

Under the new tariff, channel termination charges still range from \$54 to \$80 per month for Standard Service but drop to an across-the-board \$22.95 per month for Prime Service. This pricing is designed to make the total cost under either plan about the same for the customer once equipment purchases are factored in.

And another recent Nynex tariff filing attempts to sort out the shared billing questions arising out of unbundled equipment since that results in equipment being owned by multiple users.

Nynex is appealing the FCC order to a federal court. But it doesn't want to lose momentum in the battle with CAPs for the New York financial firms.

As can happen in a situation that involves both salesmen making the rounds and lawyers heading to court, that means the tariff pages are flying fast and furious.

☛ Rohde is associate publisher of the Center of Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 292.



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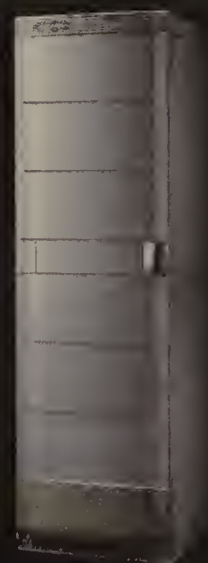
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we will go."

Kevin Kelly
President and CEO
Early, Cloud & Co.



Vendor ships message-based middleware

BY ADAM GAFFIN

Newport, R.I.

Early, Cloud & Co. (ECC) has released a message-based middleware product for users seeking to integrate legacy and client/server applications.

The vendor's Message-Driven processor (MDp) will enable companies to develop client/server applications that let end users access data on a variety of legacy systems, particularly those used for on-line transaction processing.

The software, which initially resides on IBM MVS mainframes running CICS, uses work flow script files to translate between data and form requests made by client computers of host applications.

While its software is host-based now, ECC is planning versions for 1994 that will work with servers running CICS and the OS/2 or AIX operating system.

The middleware comes with an application program interface that lets users develop client and server programs for computers running Windows, without having to write code to access low-level database and networking functions.

Kevin Kelly, president and chief executive officer at ECC, said a key component of MDp is its reliance on messages — hence the name — rather than on remote procedure calls to ferry information between clients and back-end systems. It is based on IBM's Messaging Queue Interface and Front-End Programming Interface for 3270 emulation.

Kelly said the use of messaging allows for connectionless transactions in which client systems do not have to remain connected to a host or server while the requested information is retrieved and processed. This frees up the client computer for other tasks more quickly, reduces network activity and allows for multiple parallel processes, he said.

If a user requests something that requires action from several back-end servers, MDp will bundle the information into a single response for the user through the use of object-based work flow script files.

The company said it would support emerging distributed computing and data access standards, such as the Open Software Foundation, Inc.'s Distributed Computing Environment and Microsoft Corp.'s Open Database Connectivity specification. It supports both Systems Network Architecture protocols and Transmission Control Protocol/Internet Protocol.

Kelly and Gary Krueger, the company's vice president for sales and marketing, said they are optimistic the market for CICS-based programs will expand dramatically over the next couple of years.

MDp will be priced starting at \$400,000 and include technical support and maintenance services.

©ECC: (401) 849-0500.

Client/server apps fuel cost savings at oil firm

BP slashes IT costs by \$300 million annually.

BY PETER LISKER

Houston

Information technology officials at oil company BP Exploration, Inc. are gushing over the benefits they have reaped from client/server technology, starting with annual cost savings in information technology (IT) of more than \$300 million a year.

BP, formed by 1989 merger of British Petroleum and Standard Oil, has reduced IT expenditures from \$450 million a year to \$150 million since 1989. This has been accomplished largely by downsizing from a handful of mainframes and supercomputers

to a distributed network of Unix servers and a collection of desktop systems, including personal computers, Apple Computer, Inc. Macintoshes and Unix workstations.

The new computer and network infrastructure provided a platform on which BP has rolled out a series of distributed applications based upon Sybase, Inc.'s relational

database management system. Sybase databases are used extensively throughout the company to support both scientific and engineering applications, as well as accounting and management applications.

The Almighty



"In 1989, we held a database 'shootout' designed to enable us to rapidly bring our information technology costs into line and reduce a tremendous debt position we had incurred"

during the merger, said Larry Gahagan, principal consultant for BP's Global Information Technology group. "It was imperative to move to the client/server architecture and pursue distributed database technology as a cornerstone of our new information framework."

Previously one of Oracle Corp.'s largest database customers, BP decided to go with Sybase products because of their client/server architecture. BP was impressed that Sybase's software could run in a distributed net environment and the company has become one of Sybase's largest customers.

Once the decision to go with Sybase was made, BP began housecleaning, throwing out over half of its existing applications and embarking on a projected three-year \$18 million reengineering effort begun in 1989. A unique part of the strategy was to slash the number of IT employees, a move BP strove to handle in an adroit, compassionate manner.

"We essentially told our IT people that we were going to cut IT staffing to the bone and wanted their input on how to best go

See Oil firm, page 38

Outsourcing is a savior for BP

BP Exploration, Inc. credits outsourcing for much of its success in moving from a traditional hierarchical network to a client/server environment.

The company has been outsourcing everything from application development to network services over the past few years. By taking such a radical approach, it has redefined the way it does business.

"The only way we could meet our budgetary goals was to outsource and buy off-the-shelf as much as possible," said Larry Gahagan, principal consultant for BP's Global Information technology division.

BP wields enormous power when seeking outsourcing vendors. The lure of working for such an industrial giant has made vendors more than willing to change existing products and has even encouraged them to bring BP personnel into the development process early to make sure products fit the user's needs.

BP has a policy of buying off-the-shelf software applications where possible. When a custom application is required, BP typically outsources the development job.

BP's network configuration is straightforward. It features Fiber Distributed Data Interface rings at each major site and ties them together via various wide-area network services handled by the company's carriers, including AT&T and Syncordia Corp.

The only part of BP's global network owned by the company are the FDDI local-area networks, and even they are run by consultants in some cases.

BY PETER LISKER

BRIEFS

Comshare, Inc. of Ann Arbor, Mich., this week will announce a new client/server application software package for managing budgets across an enterprise network.

Comshare's Commander Budget lets top corporate managers establish a series of distributed budgeting templates, giving them a better handle on budgeting assumptions while still giving other managers the ability to perform departmental budgeting. Commander Budget comes bundled with Comshare's Prism multidimensional database system and a relational database based on Novell, Inc.'s Btrieve system. End users can use Excel Windows to retrieve data from a server running the database software. According to the firm, it is developing a similar interface for Lotus Development Corp.'s 1-2-3. Other interfaces can be designed by users.

Prices start at \$60,000 for a 50-user license.

Comshare: (800) 922-7979.

KnowledgeWare, Inc. of Atlanta this week will announce a tool

for users seeking to migrate data from legacy systems to client/server environments. The company's NorthStar program is a Windows-based reverse-engineering system that works with KnowledgeWare's existing Application Development Workbench (ADW). It lets users recover, analyze and then migrate existing applications into ADW, from which they can be modified for reuse in a client/server environment. It supports reverse engineering of complete design models for CICS calls and other applications.

NorthStar 1.0 will be available Dec. 15 and will cost \$24,000 for a single license and \$75,000 for a five-user license.

KnowledgeWare: (404) 231-8575.

The **Corporation for Open Systems International (COS)** has released a report it says can help companies integrate X.500 directory services into an existing network using a variety of proprietary electronic mail and directory services.

The report is based on a pilot project involving the Southern Co. Copies of the report, "Directory Services: A Transition and Co-existence Approach," are available for \$25.

COS: (703) 205-2722.

When it comes to high-performance hubs, the new DEChub™ 900 MultiSwitch is a whole different animal.

For starters, it is the only hub with a technology-independent backplane that supports up to eighteen separate LAN segments, including Ethernet, Token Ring or FDDI in any slot. And it's ATM-ready today. The DEChub 900 MultiSwitch ensures your network can handle future growth and changes. Over 3GB of throughput gives you all the bandwidth you'll ever need to send anything, anytime. The DEChub 900 MultiSwitch is the most flexible and cost-effective hub around. DEChub 900 modules, as well as the award-winning DEChub 90 modules, all work as single

units or snapped into the DEChub 900 MultiSwitch backplane. And all DEChub modules are truly "smart"—just power them up and they know what to do. Management has never been simpler. You can manage the DEChub 900, DEChub 90 and all DEChub modules from a single PC or workstation. And the graphical user interface of our HUBwatch™ software makes switching and reconfiguring LAN segments as simple as the click of a mouse. Curious to know more about this interesting creature? Then call your local Authorized Digital Reseller, or 1-800-DIGITAL. Please reference BFA when you call. And get a hub that shows its true colors when it's time for a change.

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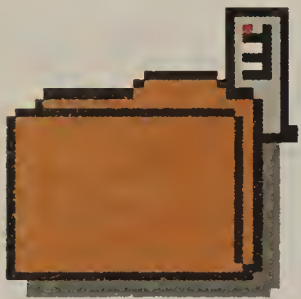
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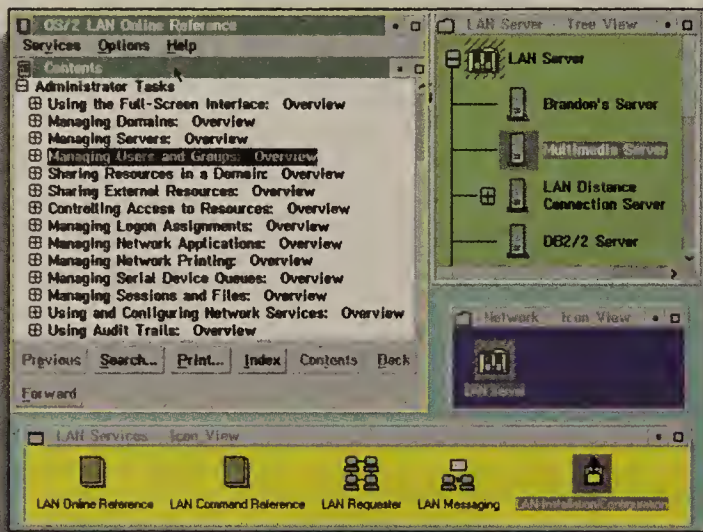
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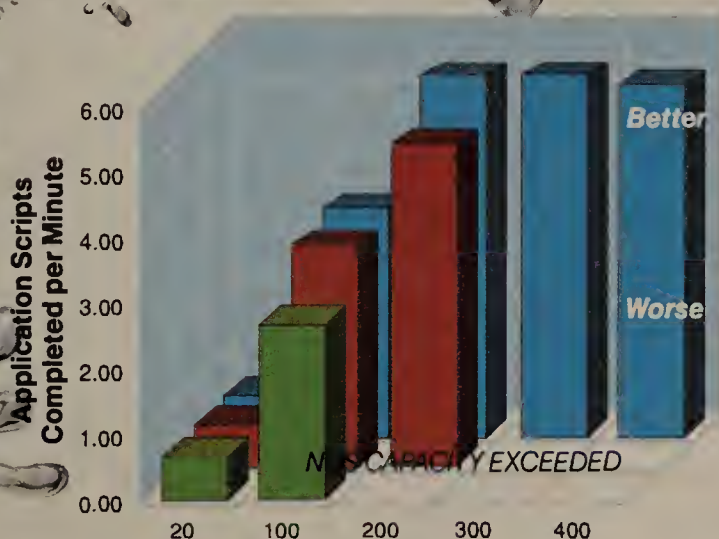
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grief.

IBM announces new E-mail, facsimile AS/400-based software

BY PETER LISKER

White Plains, N.Y.

IBM has announced a new entry-level electronic mail system and new facsimile software for its Application System/400 minicomputer platform.

The announcements highlight IBM's posi-

tioning of the AS/400 as an alternative platform to traditional desktop systems for supporting client/server applications.

The new E-mail package, IBM OfficeVision JustMail/400, is a subset of IBM's full-fledged OfficeVision/400 software. The new software, which is upward-compatible with OfficeVi-

sion/400, includes components that reside on both the AS/400 and personal computers attached to it.

The new software includes note editing and information filing capabilities, among others. Users that require advanced capabilities, including calendaring and word processing, can upgrade to OfficeVision/400 without disrupting IBM OfficeVision JustMail/400 directories.

The new E-mail package is designed as a low-end system and as such has limitations, including a big appetite for memory.

Users of the new IBM E-mail offering can

exchange messages with users of other IBM and non-IBM E-mail systems utilizing gateways from SoftSwitch, Inc. and other such vendors.

IBM OfficeVision JustMail/400 is available now. It costs \$995 per host and \$12,250 for 250 users.

IBM also announced immediate availability of Facsimile Support/400, an enhancement to existing fax software that allows Personal System/2-based local-area network users with PC fax boards to exchange faxed documents via AS/400 hosts.

The software runs on AS/400 hosts and doubles the previous number of fax-capable users on a LAN attached to the host.

The product is available now for \$100.

©IBM: (800) 426-3333

Oil firm

Continued from page 34

about this," Gahagan said.

The resulting plan called for employees to assist in the reengineering effort, lending their expertise to migrate applications to the client/server environment. In return, the company provided training in Unix, Sybase, distributed database design and management for the workers who would be leaving. This enabled the company to leverage the knowledge and skill of the existing staff, while also providing the workers with enhanced job skills.

According to Gahagan, the reengineering effort was hugely successful.

"We finished the effort in two years instead of three and brought the project in at \$13 million — over \$5 million under budget," Gahagan said. "When we were finished, our employees found they were more marketable and [they] have been successful moving to other jobs."

The project was so successful that BP was able to cut its IT staff from 2,000 to 120 people. Those cuts were made possibly largely thanks to a fundamental change in the way BP went about running its IT department, Gahagan said.


The company decided that it would no longer maintain a traditional IT department, typically charged with developing, maintaining and operating information systems. Instead, BP developed a core group of consulting IT personnel who oversee a massive outsourcing effort now in place (see story, page 34).

By making such a radical shift in the way it supported information services, BP found that downsizing applications from mainframes and supercomputers to distributed client/server systems became addictive.

"Once you decide to downsize, anything is possible," Gahagan said. "One example of this was a reservoir modeling system that formerly ran on a Cray Computer Corp. supercomputer. We moved the database and applications down to a series of IBM RS/6000 and [Hewlett-Packard Co.] servers and now run the system for a tenth of cost."

"Another system, a reservoir production database, used to run on a [Digital Equipment Corp.] VAX 9000 system under an Oracle database, and now runs on a workstation using a Sybase database," he added.

Gahagan said the move to client/server has made BP's IT organization more flexible, as it has expanded into different countries without having to even set up data centers there. □



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with an integrated monitor. But despite the extremely small footprint, it's anything but meek.

For starters, there's an integrated network interface for either Ethernet or Token Ring environments.

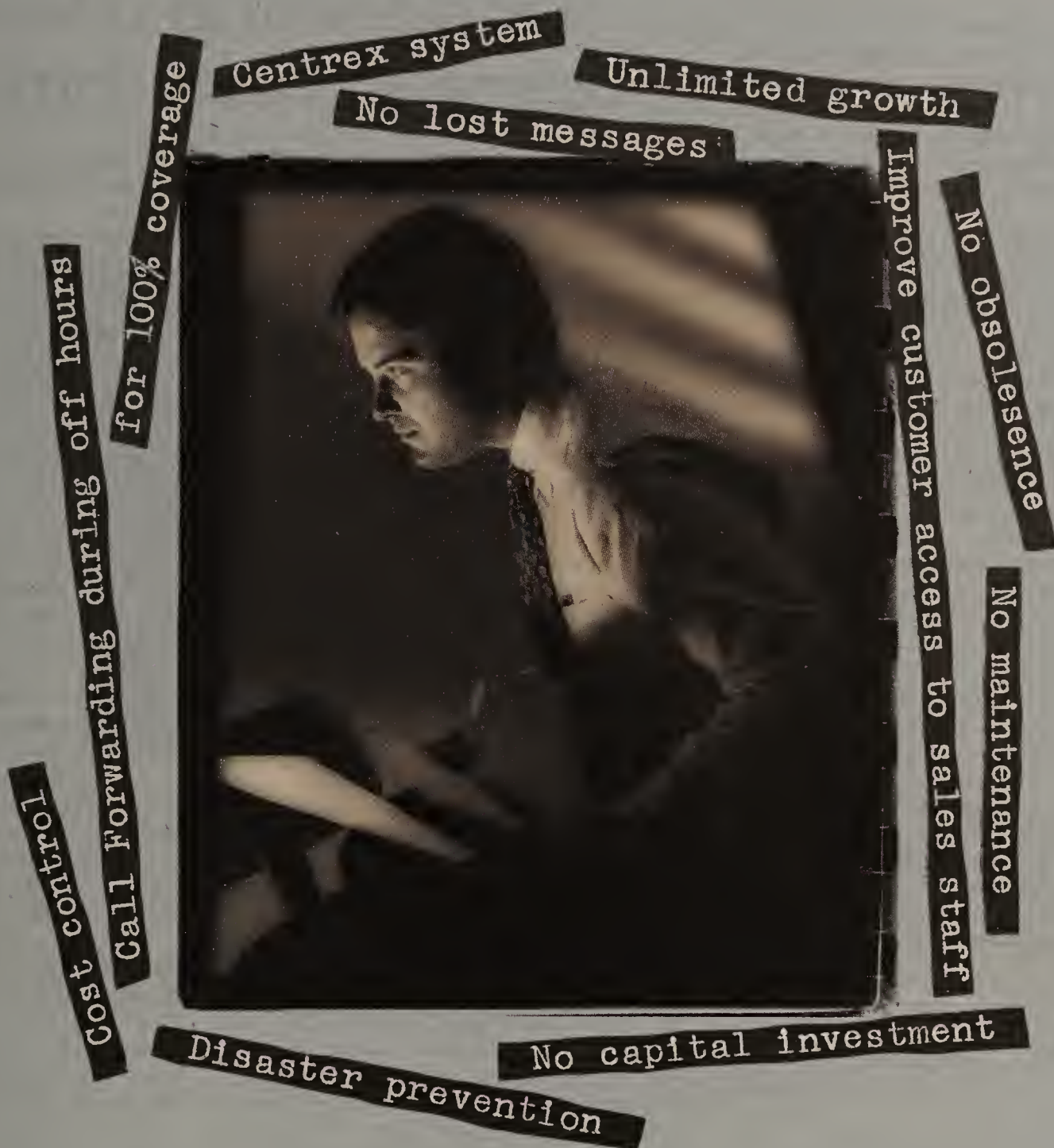
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PETER CAPARSO

ACCOUNT EXECUTIVE, NEW ENGLAND TELEPHONE.

Keeping His Mind On Paul's Business.

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Editorial

An open letter to FCC Chairman Reed Hundt:

As you take the helm of the Federal Communications Commission, you face a significant challenge: positioning the agency for a leadership role in a new era of communications.

The boundaries between the communications, computing and entertainment worlds are dissolving, and the FCC must take the lead in defining new rules that protect consumers and preserve the dynamism of the free market.

A recent *NW* study (Oct. 25, page 1) showed users feel regulatory policies are out of touch with market realities. They also feel the FCC is the government body best positioned to deal with these changes.

But it's not clear the FCC is up to the challenge. Too many decisions have been flawed (cable television price regulation, for one) or overturned by the courts (e.g., the decision regarding tariff filing requirements). At times, the agency seems overwhelmed with the challenges facing it, without the resources to address those challenges.

On other occasions, the FCC has been downright confusing. For example, the FCC granted Nynex a waiver allowing New York Telephone to bundle multiplexing equipment with its Enterprise Services offering — only to rescind the waiver months later, when customers were up and running.

One area that really needs your leadership is the local loop. Simply put, competition isn't developing fast enough. Ten years after divestiture, the local loop is far behind the interexchange market in diversity of services and innovation in service packaging, billing and pricing.

Tough challenges — such as maintaining the concept of universal service — should be addressed right away. Recent legislative efforts have pushed this issue to the fore, but that could be a real problem. If the FCC is forced to enact a broadly worded legislative mandate on opening up the local loop, we may very well face a mess similar to cable TV rate regulation.

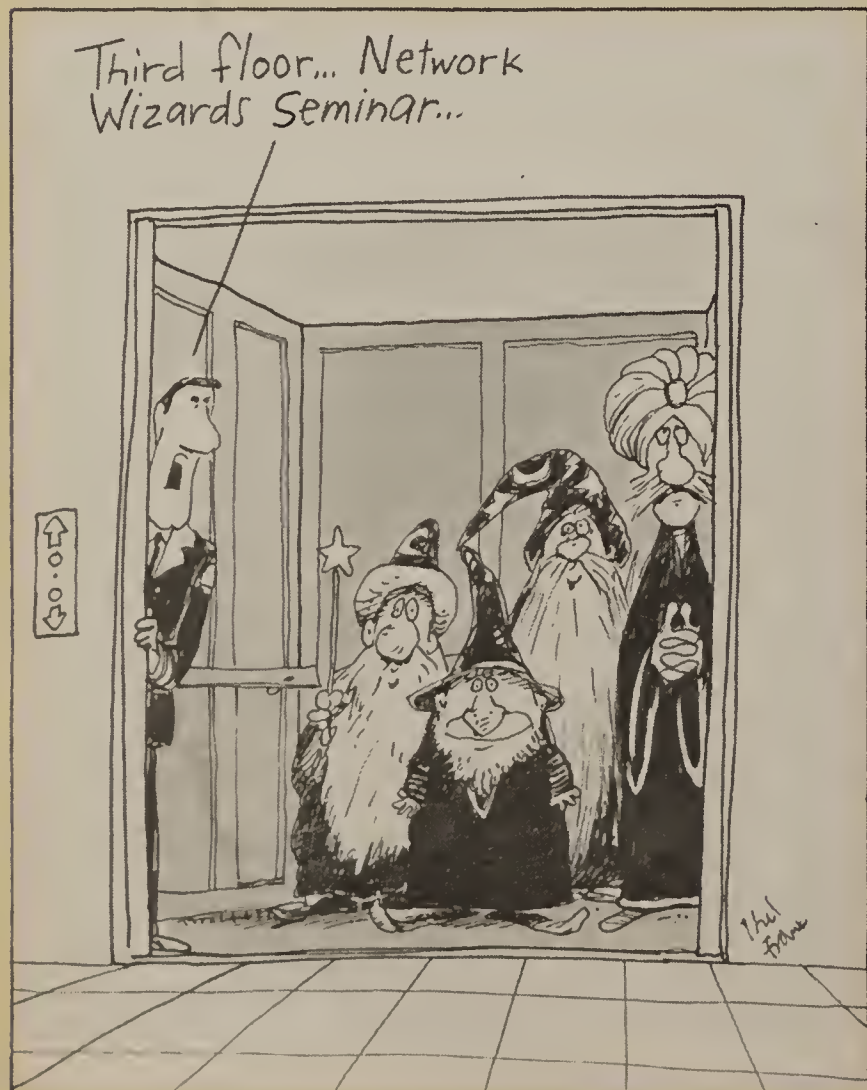
The FCC has taken some steps to promote competition, but it needs to get more aggressive. Spurring competition in the local loop promises to be one of the best ways to speed development of the Information Superhighway — a term that has become widely adopted, if little understood.

On this and other issues, the FCC needs to be more than an advisor to industry. It needs to lead the U.S. into a new communications future.

→ JOHN GALLANT

TELETOONS

FRANK AND TROISE



DATABASE UPDATE

by Richard Finkelstein

DRDA worth a look for micro-to-mainframe apps

When it comes to connecting SQL database servers to mainframe relational databases, IBM's Distributed Relational Database Architecture (DRDA) has much to offer users (*NW*, Nov. 8, page 1). It is inexpensive and reliable, and it supports performance levels suitable for a wide range of micro-to-mainframe database applications.

Connecting local databases to mainframe databases has become a major area of interest in user organizations that are migrating to network-based database systems. Most of these new applications must access mainframe databases in some way, since mainframe computers still hold the vast majority of database information.

Even with the emphasis on downsizing applications, very little user data has been actually transferred off mainframes. Middleware products from various vendors try to provide connectivity between local and mainframe databases, with varying degrees of success. Vendors have found it difficult to provide connections that are both reliable and provide good performance.

The advantage that IBM has in connecting local-area network-based applications to mainframe databases is that it has control of the underlying operating systems, communication links (for example, Advanced Program-to-Program Communications) and relational database management system architecture, which comprise its DRDA architecture. With this control, IBM has the ability to design and test its various distributed database platforms so they seamlessly converge. While it is true that this type of single vendor environment limits choices, it does provide the opportunity to build a tightly integrated set of products.

Other third-party middleware gateway and database vendors do not have this luxury. They are constantly adjusting their product designs to reflect unforeseen changes or problems in the underlying network hardware and operating systems. They must also react to major revisions in target relational DBMSs, which are not known until the relational DBMSs are released. This struggle to maintain connectivity in very fluid environments undermines reliability and performance.

DRDA capabilities are built into each of IBM's relational DBMSs, including the variations of DB2 on OS/2, AIX RISC System/6000, MVS, Application System/400 (on which DB2 is known as SQL/400) and VM (on which DB2 is called SQL/DS). On IBM's OS/2 and RS/6000 platforms, DRDA is implemented in the DDCS/2 and DDCS/6000 products. Other database vendors such as XDB Systems, Inc. and Informix Software, Inc. also offer DRDA support in their relational DBMS or gateway products.

One of the major advantages of DRDA is that it permits applications to directly access mainframe databases without going through an intermediary gateway.

Other middleware vendors depend on gateways to translate communication protocols and database information. These gateways can be expensive — costing anywhere from \$50,000 to \$200,000 — and difficult for users to install and administer. Compare this

with IBM's OS/2 DRDA product, DDCS/2, which costs less than \$5,000 and can support a dozen or more users.

Initial customer feedback on DRDA performance characteristics has been good. While traditional gateway products such as Information Builders, Inc.'s EDA/SQL have had chronic performance problems, this does not seem to be the case with DRDA. This is probably due to the tightly woven product architecture that IBM has put together.

However, there are several important limitations to DRDA. First, and probably most important, DRDA works only with relational databases. Vast amounts of mainframe data is still stored in nonrelational data sources such as IMS, IDMS and VSAM files. DRDA does not provide a mechanism for accessing these databases.

In this area, other middleware products provide much more flexibility. For example, Sybase, Inc.'s Open Server for CICS and Micro Decisionware's Database gateway both allow applications to execute mainframe CICS transactions. The CICS transactions act as remote procedure calls (RPC), which can access nonrelational data sources and return the data to the application program. DRDA does not support the notion of an RPC at this time.

DRDA is also difficult to install. Only companies with considerable expertise in IBM communications software and CICS should attempt to work with DRDA at this time. Recent versions of DDCS/2 are supposed to make installation much easier, but so far, based on customer feedback, it is not clear whether IBM has achieved this goal.

Third-party support for DRDA is also limited at this time. Many vendors have announced support for DRDA because announcing products is easy. Delivering products is a different story, and, until now, middleware vendors have not shown any strong indication that they will be supporting DRDA.

Companies such as Oracle Corp. and Sybase would probably prefer not to support an IBM standard since this interferes with their own internal standards and puts IBM in control. Other companies may be delaying product introduction due to lack of customer interest or lack of personnel and monetary resources.

Whatever the reason, IBM is still the primary provider of DRDA software and will probably remain so for the time being.

Users debating whether or not to implement DRDA face a tough decision. On one hand, going with DRDA limits users' choices since DRDA currently is implemented only on IBM operating systems with IBM relational DBMSs. On the other hand, DRDA offers one of the best — if not the best — means for connecting LAN-based database applications to IBM's mainframe relational databases.

It's a tough call, but if reliability and performance at a low cost is important to your organization, then DRDA is worth a look.



♦ Finkelstein is president of Performance Computing, Inc., a consulting company in Chicago that focuses on client/server and rightsizing applications. He can be reached at (312) 549-8325 or via CompuServe at 72240,2536.

USER FORUM

by Douglas Welch

Networking: The simpler, the better

In these days of bundled software and preconfigured PCs, it seems odd that setting up the average net requires the equivalent skills of a rocket scientist and a couple of theoretical physicists. While most of the computer industry has strived to make systems as user-friendly as possible, net systems manufacturers seem to think that the more obtuse and complex a product, the better.

The last 10 years have seen the computer industry grow from mainframe-oriented, command-line systems that required priest-like dedication to operate to graphical user interface-based, user-friendly, point-and-click environments that almost anyone can use.

Unfortunately, networking systems have become even more arcane than ever. Despite the freedoms of personal computing, in networking it seems everything old is new again.

While large corporations may be able to afford the staff and training required to install and maintain a net, the increasing complexity of network systems has left managers at many smaller organizations scratching their heads. Where do they turn to find a networking solution that doesn't require investing a lifetime to install or understand? Most small businesses don't even have the shelf space

required to store the requisite wall of Novell, Inc. NetWare "red manuals." With corporations downsizing more than ever, small business startups are increasing in number. Networks should help these companies' growth, not hinder it.

One major reason for this unneeded network complexity is the proliferation of hundreds of networking standards. When IBM owned the computer market, standards were simple. If IBM made it, it was a standard. Today, in an effort to corner the market, every networking vendor has its own supposed standards. These companies seem more interested in increasing their cash flow from patents than solving users' problems.

While one standard for each technology might seem an impossible dream, it is time that manufacturers stopped worrying about creating the next "industry standard" and focus on providing solutions.

What is needed today is a simple and cheap networking system that can be installed by anyone, whether they are the manager of an enterprise network or a home office worker with two computers and a printer. No node numbers, no specialized net drivers for each type of computer, no expensive or complex wiring, just a straightforward

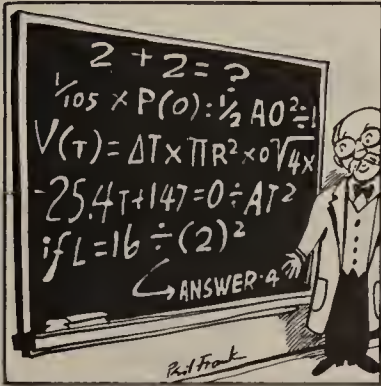
network for linking two or more machines.

Apple Computer, Inc. saw a need for this type of networking when it designed the Macintosh. Apple included basic network support with every system. It has been almost 10 years since the Macintosh's debut. Why haven't other manufacturers caught on? Macintosh work group networks are recognized as the easiest to set up, and they provide productivity gains almost immediately.

Unfortunately, even AppleTalk nets can get complicated as they grow into corporate local- or wide-area networks. Networking manufacturers have to ensure that their systems are scalable. Small businesses usually don't plan on staying small for long. Manufacturers shouldn't take an easy-to-use system and burden it with complexity whenever it grows beyond the most basic design. Their systems should let users grow as needed, without major reinvestments in new technology.

The networking industry has a lot of catching up to do to match the ease of use of the computers it connects. It is time to remove networking from the hands of the wizards and turn it over to the users. The future is coming, and users need networking tools that will allow them to effectively embrace it and all its changes.

◆ Welch is a support analyst for a major entertainment corporation in Los Angeles. He can be reached via the Internet at 76625.3301@compuserve.com.



AND ANOTHER THING...

by Michel Kabay

How I almost became a hacker

Criminal hacking is a social problem, not merely a technical issue. I realized this once again when I inadvertently became a hacker myself recently while on a business trip.

I had checked out of my hotel room and went to a deserted lounge on the 29th floor to work. I wanted to check my electronic mail but the wall phone's handset had no dial or buttons. The line was clearly intended for inbound calls only.

"I bet I can use the computer dialer," I thought defiantly. After all, it's not as if the hotel had to pay anything for my outbound local call. It's not hurting anyone. It's no different from my habit of plugging a modem into the hotel room's phone jack or dismantling a nonmodular wall unit to patch in an RJ-11 connector for my modem. I always put everything back together again without damage.

I finished my downloads and uploads and unplugged my equipment. I was satisfied at accomplishing my goals despite the hotel's silly restrictions and went to lunch.

While eating, I began to think

about what I had done. I had used somebody else's phone for my own purposes — without permission and in defiance of their security measures. I had excused myself by rationalizations: The network access node was just sitting there doing nothing; it (probably) wouldn't cost the owner anything for me to use it; and they'd never know anyway.

Just like a hacker, I had ignored the fundamental social and legal principle that owners have the right to control their property. I had no right to decide how the hotel used its phone system any more than a hacker has the right to use my computer system without my permission.

I went to the hotel guest services desk and spoke with a pleasant young woman. After I explained what I wanted to do, she graciously allowed me to use the phone jack for local calls.

But what if she hadn't agreed?

I would have spoken with the hotel manager. I would have verified that the call wouldn't cost them anything and pointed out that I had just been a guest for five days at a cost considerably beyond that of a local call. Would she grant me permission as a gesture of good will? If so, I would carry away with me a memory of service beyond the letter of a mere contract.

If that didn't work, maybe I'd write a letter to the CEO of the hotel chain suggesting a change in their policies. But in any case, whether I agreed with them or not, it was their phone not mine.

Criminal hackers rationalize their actions just as I did. They want to explore cyberspace; other people own the equipment and the channels. They believe that their desire for education and excitement outweighs the costs to owners and users of the systems they invade.

Rubbish.

There is no mutually satisfactory

transaction between criminal hackers and network owners. Hackers' needs are not our obligation, just as my desire placed no obligation on the hotel to satisfy it. The universe does not owe criminal hackers a free network node.

Criminal hackers often claim that their depredations serve a useful social purpose by bringing security weaknesses to light. If they are sincere, they should negotiate with the owners of networks for mutually satisfactory testing arrangements.

All of us should be reaching out to educate young people about the rules of network usage — in schools, in colleges and universities, even in youth clubs and scout troops. We have to extend the rules of morality and civility — of respect and communication — into cyberspace.

We support driver education classes; how about network education classes?

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IMAGING Buyer's guide

The imaging payoff

Users reap the reward as vendors continue adapting their products to run in open environments.

BY MICHAEL HURWICZ

In recent years, users have started reaping the productivity and financial rewards of document imaging. By working with computer-based images of documents stored on an image server and viewed on client workstations, companies are streamlining business processes while reducing paper consumption and storage costs.

For instance, the claims department at American President Lines uses the work flow capabilities of FileNet Corp.'s WorkFlo Business System to cut the time it takes to process a major claim for lost or damaged cargo from 15 days to just two days. The firm enables adjusters to pull up electronic copies of claims, supporting information instead of relying on paper files, says Loretta Goralczyk, the firm's imaging project manager.

Likewise, Westbrook Technologies, Inc.'s File Magic Plus for Workgroups software saves 600,000 sheets of paper a year at Transylvania Community Hospital, a 100-bed medical facility in Brevard, N.C., says David Stuecher, manager of patient accounts at the hospital.

"We download anything that would have been printed, such as detailed bills, and we scan documents that come in from outside the hospital, such as communications from patients and inquiries or benefits explanations from insurance companies," he says.

A prime driver in helping users obtain such payoffs is vendor moves to adapt high-cost, proprietary imaging platforms to run in environments that utilize a mix of widely available, third-party products, such as personal computers, Microsoft Corp. Windows and, increasingly, standardized versions of Unix.

The adapted systems may include server software running on PC- or Unix-based servers. Some server software even runs on mini-

computers or mainframes. The server software works with a variety of scanners, compression/decompression boards, database management systems, optical disk drives and jukeboxes to manage image storage. Windows and Unix are currently the most popular server platforms because they provide better price/performance than non-Unix minicomputers and mainframes (see graphic, page 51).

The systems also come with client software that enables Windows-based PCs, Apple Computer, Inc. Macintoshes or Unix workstations to retrieve and display images across a local-area network.

The imaging software market has also been bolstered by the enhancement of work flow capabilities, which are strongest in high-end products, costing upward of \$1,500 per user. Work flow is used to create applications that intelligently route and reroute images along predefined paths following user-defined rules. Advanced work flow features make high-end products better suited to complex applications, such as handling insurance claims or allowing medical professionals to view medical records.

High-end products are also more likely to have distributed features, such as separate scanning and optical character recognition stations, support for image databases that are detached from the server running imaging software and the ability to search multiple databases with a single query.

In addition, high-end systems are more likely to support features such as prefetching and staging, which bring images from slower optical media to faster magnetic media before users request them. Another high-end feature is customizable caching, which keeps frequently accessed images stored in server memory or on media supporting the quickest access time.

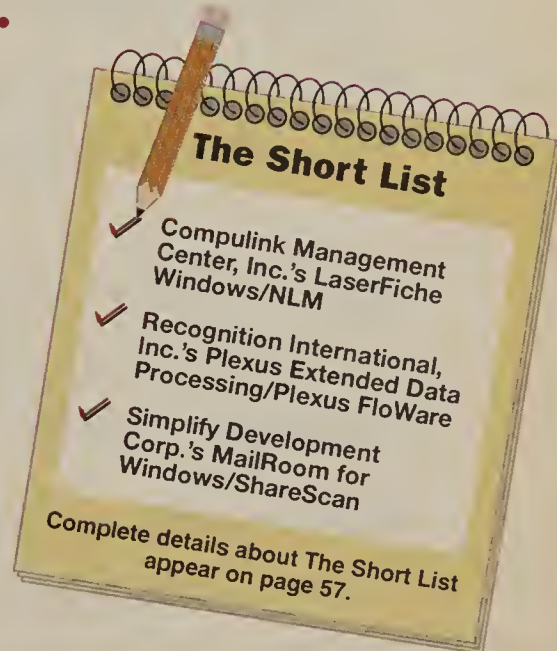
High-end systems also support a slew of other features, including Computer Output to Laser Disk devices that store nonimage infor-

mation on optical media, batch scanning that enables users to scan multiple pages in a single operation, and print by reference that enables users to route an image directly to a printer instead of having it sent to the workstation first, thus speeding the printing operation and reducing network traffic.

Traditional leaders in the high-end of the market include FileNet, ViewStar Corp., IBM, Recognition International, Inc. and Wang Laboratories, Inc.

Companies with roots in mainframes and minicomputers, such as Bull Worldwide Information Systems and Data General Corp., also compete successfully in this arena, faring par-

Continued on page 51



Imaging vendors doing Windows

Early imaging systems were usually isolated from other computing systems. Even when they ran on shared processors such as mainframes or minicomputers, other applications could not access images.

But imaging in a vacuum is no longer ideal. Today, many vendors are supplying client software that utilizes standard Windows components that enable users to integrate imaging into a variety of applications. The primary Windows standards vendors support are Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE).

DDE can be implemented to support server or client functionality. A DDE server is necessary to make imaging functions available to other Windows programs and is much more difficult to program than a DDE client. Thus, vendors offering DDE server capabilities show a greater dedication to the Windows standard.

With DDE, a user can bring the image of an invoice into a word processing document, for example. The word processing application would be the DDE client requesting a service, while the imaging system would implement DDE server functionality to satisfy that request.

Most companies that support Windows offer DDE client functionality, although Westbrook Technologies, Inc. supports DDE server but not DDE client. This means that images can be made available to other programs via DDE, but images managed by other programs cannot be accessed via DDE.

Companies with both DDE clients and servers include IBM, IdentiTech, Inc., Image-X Enterprises, Keyfile Corp., Lanier Worldwide, Inc., LaserData, Inc., NCR Corp., Optika Imaging Systems, Inc., Recognition International, Inc., Sigma Imaging Systems, Inc., Teamworks Technologies, Inc. and Winthrop Stewart Associates, Inc. One other company — Compulink Management Center, Inc. — has announced DDE client and server functionality but has not provided a release date.

OLE is not yet widely supported. Only NCR offers support for both OLE 1.0 and 2.0. Recognition and Keyfile support OLE 1.0.

However, in the long run, OLE 2.0 will offer a solid standard for image-enabling Windows applications.

"As OLE 2.0 rolls out in '94, it will take over from DDE," says Bruce Silver, vice president of BIS Strategic Decisions, a market research firm in Norwell, Mass.

OLE enables users to take images managed by the imaging system and use them in any other application that supports OLE. Using an OLE 2.0 feature called OLE automation, users can program a nonimaging application to perform imaging functions by tapping into the imaging system.

BY MICHAEL HURWICZ

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Continued from page 47

ticularly well with their established customers.

Products at the low end target the simpler problems of individuals and smaller work groups by supporting repetitive tasks performed by such professionals as attorneys and doctors.

Low-end products may cost as little as \$200 per user and as high as \$2,000 per seat. They tend to be based on PC standards, such as Windows, Novell, Inc.'s NetWare and IBM's OS/2. Work flow programming, if available, tends to be less sophisticated or offered only via third-party add-on modules.

Included in the fast-growing group of vendors that offer low-end systems are Compulink Management Center, Inc., IdentiTech, Inc., Imara Research Corp., Keyfile Corp., LaserData, Inc., Optika Imaging Systems, Inc., PaperClip Imaging Software, Inc., Pinnacle Micro, Inc., Teamworks Technologies, Inc., TechKNOWLOGY Acquisition, Inc. and Westbrook Technologies.

The distinction between the low and high end is not a totally black-and-white one, says Jamie Popkin, program director for the office information systems service at Gartner Group, Inc., a consultancy in Stamford, Conn. "There may be instances where a vendor from one segment plays in the other."

High-end vendors, for instance, now almost invariably support Windows and NetWare. They also have expertise in linking with third party-provided SQL databases. Meanwhile, as PCs, NetWare and Windows grow more powerful, low-end vendors are building on that base to expand from the work group and department into the enterprise.

The large and growing number of imaging vendors — particularly in the low end — makes product selection difficult, as does the fact that there are few widely accepted standards for imaging (see story, this page).

TAILOR-MADE?

One key characteristic distinguishing high-end from low-end systems is the degree of customization supported.

High-end systems such as FileNet's WorkFlo Business System, IBM's ImagePlus, Wang's OpenImage for NetWare, Recognition International's Plexus Extended Data Processing (XDP)/Plexus FloWare and ViewStar's ViewStar are essentially back-end services that also provide tool kits for image-enabling existing applications or for creating new imaging applications. These products almost invariably require a value-added reseller (VAR), consultant or the imaging vendor to create custom applications for the user.

However, these products also offer great flexibility in building applications that closely follow work flow patterns and offer benefits in reducing the need for human intervention.

Low-end systems offer more limited facilities for image-enabling existing applications or creating new ones. Low-end systems may offer facilities for routing documents through a predetermined cycle, although not with the same flexibility and intelligence as the higher end systems.

Work flow processing has historically been closely associated with imaging because imaging applications that give the greatest return on investment tend to involve highly structured

or repetitive work. These applications require document image routing and annotating, as well as such capabilities as automated interaction with mainframe- and PC-based applications and automatic, intelligent generation of letters, facsimiles and electronic mail.

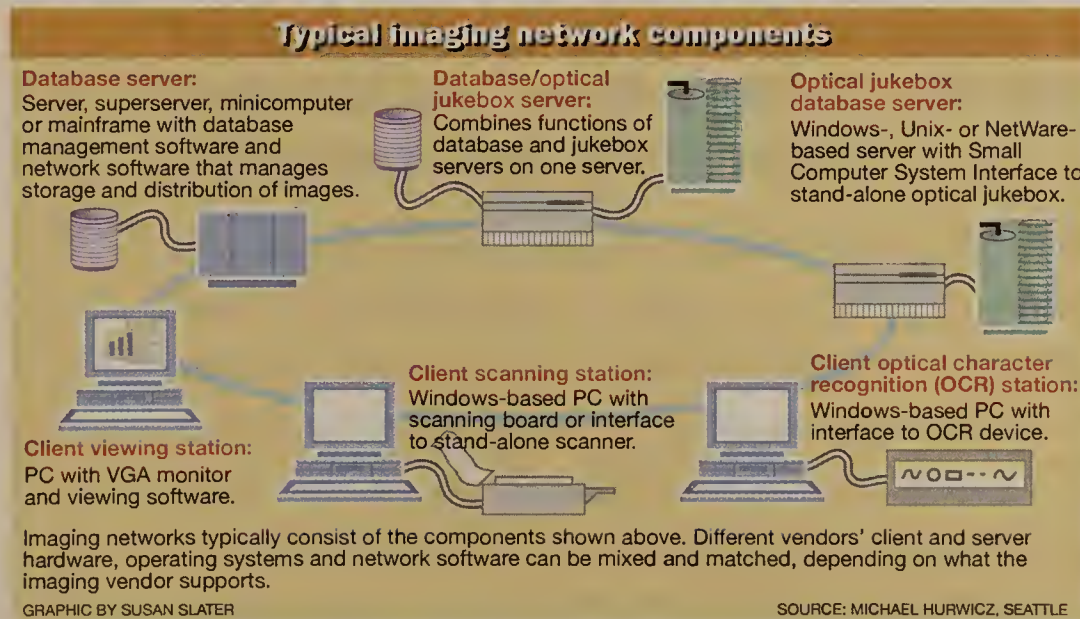
The work flow capabilities of some imaging products are enabled by E-mail packages.

For instance, a clerk may route an image of an invoice in an E-mail message to a manager for approval. Once approved, the invoice is automatically sent to a clerk for payment. However, if the manager does not approve the invoice and more robust work flow capabilities are available, a letter can be automatically generated to inform the person who submitted it of the rejection. Also, the invoice could be passed up to a department head for further investigation.

The imaging packages providing users with more flexibility are those that support third party-provided work flow add-on modules because they leave customers free to make choices about work flow independently of imaging products, and vice versa.

"Currently, many of the strongest work flow vendors, such as FileNet and ViewStar, still link work flow tightly to the imaging system," says David Wood, vice president of new business development with Law Cypress Distributing Co., a San Jose, Calif.-based value-added distributor specializing in imaging. "Other vendors are separating the two. For instance, you can use [Recognition International's] Plexus work flow software with Wang imaging software."

Users worldwide laid out \$2.1 billion for 7,955 imaging systems in 1992 and are expected to shell out \$6.3 billion for 19,255 systems by 1997, according to Dataquest, Inc. Of the money spent in 1992, \$2.07 billion was used to purchase high-end products, leaving only \$30 million left to purchase low-end products.



Even as other imaging vendors are separating work flow from imaging, users are still finding it difficult to cost-justify work flow separately from imaging, says Mary Bamford, a senior industry analyst with BIS Strategic Decisions, a market research firm in Norwell, Mass.

"IBM recently introduced work flow that is not image-centric," Bamford says. "However, work flow only recently emerged as a business opportunity separate from imaging, and users are finding it difficult to cost-justify work flow software in nonimaging applications, even though they understand the benefits of it."

As users try to cost-justify at least the imaging part of the equation, they need to begin analyzing their underlying business processes — both what is currently being done and what

needs to be done. For simple image storage and database indexing and retrieval, a low-end system with a good user interface may be ideal.

"Ease of use is the No. 1 consideration for imaging in most law offices," says Sam Militello, managing attorney in the Militello Law Office in Watertown, N.Y. "It has to be very easy to train staff to use the program."

The Militello Law Office uses Westbrook Technologies' File Magic for filing and indexing litigation papers. In this type of application, the imaging system is just a substitute for a filing cabinet — a highly portable one. The application enables attorneys to bring millions of documents into court in a laptop computer, as opposed to boxes of files.

On the other hand, an application such as insurance claims processing typically requires a lot of routing and rerouting of images among such personnel as claims adjusters, customer service agents and payment clerks. For such complex processes, a consultant, VAR or the imaging vendor is usually needed to help design the application.

While finding an imaging system that can meet application needs is usually the starting point in the selection process, it may be possible to eliminate some products because they don't support existing or preferred hardware, operating system, network operating system (NOS) or database platforms.

HARDWARE AND OS PLATFORMS

Existing workstation and server platforms often have a decisive influence on users' selection of an imaging system.

For example, a work group based entirely on Sun Microsystems, Inc. workstations and Unix is unlikely to adopt PCs and Windows for its imaging system, even though a Windows-based imaging system might do an effective job for less money. Similarly, it's a big jump from Windows to Unix.

Standard images

As users look to make images created in one system available to other imaging systems, they should examine vendor support for standard image file formats such as the Tagged Image Format File (TIFF), PCX and the Joint Photographic Expert Group (JPEG).

TIFF defines the structure of files used to store images. Nearly every popular imaging vendor supports this standard. Unfortunately, all TIFF files are not created equal nor are the TIFF reader programs designed to examine image files.

One potential difficulty is the custom tags some vendors support. Vendors add custom tags to their files if the well-known set of tags cannot fulfill all application requirements. Therefore, image files that utilize custom tags can only be read by the system that created the images.

And even among well-known tags, every TIFF reader may not be designed to read every one of them. In particular, a vendor that doesn't use a particular tag when creating TIFF files may design a TIFF reader that ignores that tag.

"Go below the data sheets to test for TIFF compatibility," says David Wood, vice president of new business development with Law Cypress Distributing Co., a San Jose, Calif.-based value-added distributor specializing in imaging. "Everybody claims they support TIFF. But FileNet [Corp.'s], Wang [Laboratories, Inc.'s] and ViewStar [Corp.'s] TIFFs are all very different."

Make sure your tests are thorough. For instance, some beta versions of Watermark Software, Inc.'s Watermark Discovery Edition appeared to annotate TIFF files. A TIFF file could be annotated and saved, and the annotations would appear on the screen when the file was retrieved with the imaging editing program.

However, when a different program used the TIFF file, the annotations would not appear. For instance, if the file was faxed, the facsimile program sent only the original material, not the annotations.

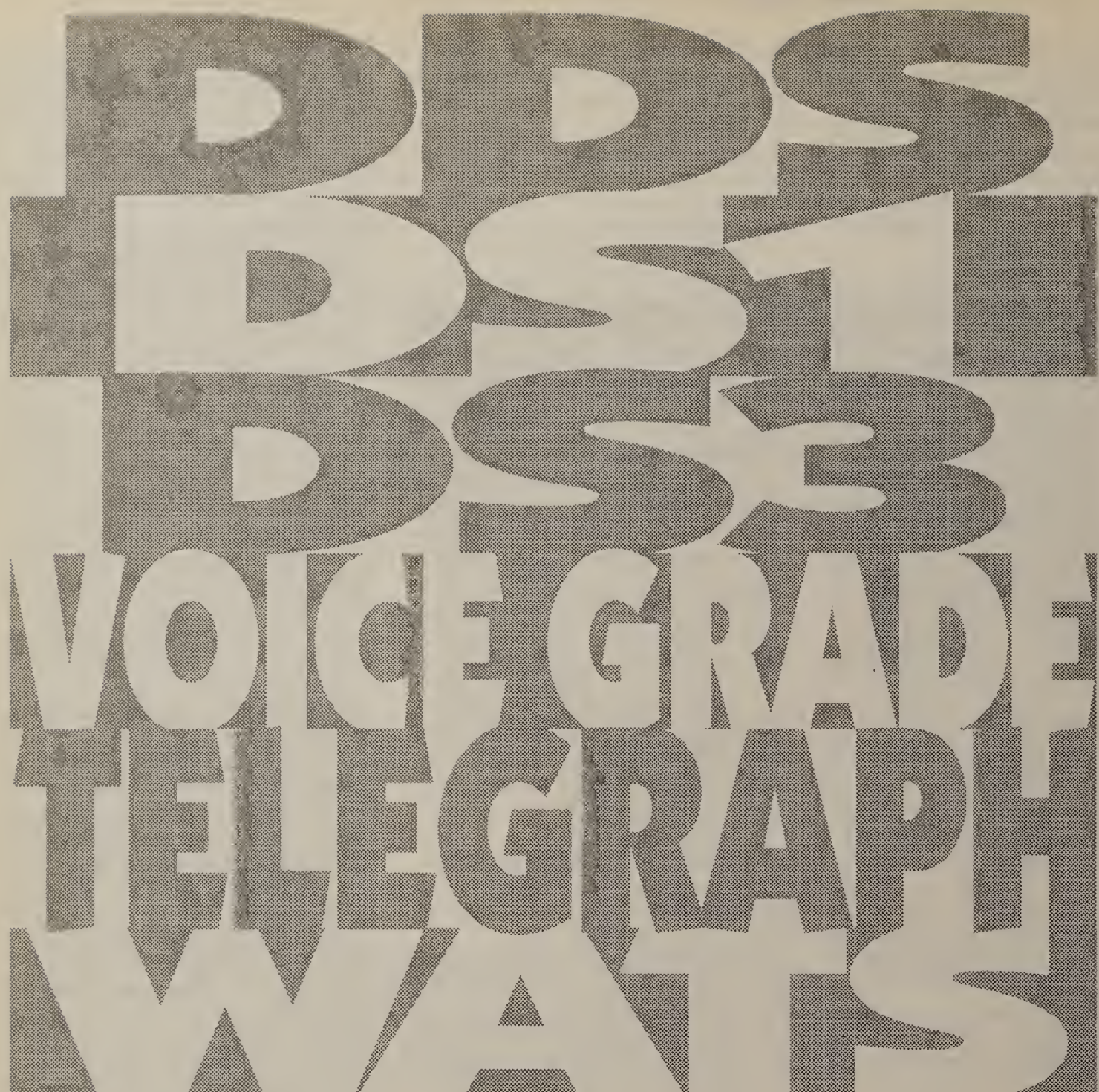
A more common problem is a TIFF reader that reads some TIFF files improperly or not at all. The TIFF standard is employed in conjunction with Group III and Group IV compression. For TIFF readers supporting one compression method but not the other, files will have to be converted before they can be read.

Support for PCX and JPEG is not as common. Like TIFF, PCX and JPEG are designed to let images created in one system be exported to another system. Alternatively, one system can import TIFF, PCX or JPEG files from another system. PCX is a de facto standard for storing graphics files on personal computers, while JPEG is used to compress color image files.

It's convenient to import and export non-TIFF files without resorting to a third-party utility. But conversion utilities are a viable alternative if an imaging system can't handle a particular type of file.

BY MICHAEL HURWICZ

Continued on page 53



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The benefits of imaging NLMs

A few imaging systems vendors have made a special effort to offer more effective support for Novell, Inc. NetWare environments by offering NetWare Loadable Modules (NLM) that function as image database managers or as drivers that enable users to directly connect optical jukeboxes or optical disk drives directly to a NetWare server.

For database management, the NLM approach tends to be more robust and secure than approaches that depend on drive redirection, which is also called drive mapping or virtual drives. With drive redirection, each client can open files on what looks to it like standard DOS drives. This contrasts with the NLM-based approach where clients make requests of the NLM, which takes over responsibility for knowing what files are being opened.

For instance, if an NLM manages the image database, a client workstation crash cannot corrupt the database, as it can if the client opens database files on a virtual drive. The virtual drive approach is like having multiple people flipping hamburgers in the same frying pan using long tongs. If one person falls down, there's a good chance their hamburger may burn.

The NLM approach is like having one cook flipping hamburgers and serving them to multiple people. A hamburger will never burn unless the cook makes a mistake — a much less likely occurrence.

Security is also improved with an NLM-managed database because the NLM searches through the database and sends only necessary information to the client. This approach also provides the benefit of reduced network traffic.

NLMs may also provide a faster response time because less data goes across the network.

However, this does not appear to be consistently true, according to observers, perhaps because of the inefficient coding of early NLM implementations.

Compulink Management Center, Inc.'s LaserFiche Windows/NLM, Lanier Worldwide, Inc.'s Lanier IMS Online and Simplify Development Corp.'s MailRoom for Windows/ShareScan all use an NLM for database management, for example.

An NLM-based driver enables users to attach an optical storage device to the NetWare server rather than having to use a separate machine. Direct attachment also makes caching to the file server's magnetic disk more efficient.

LaserData, Inc.'s DocuData and Pinnacle Micro, Inc.'s Paperless One offer NLM-based jukebox drivers.

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Continued from page 51

Image-X Enterprises' IMAGEmate is a standout in supporting DOS, Windows and Unix for both clients and servers. Teamworks' Frequent Filer supports DOS, OS/2 and Windows NT servers but only DOS and Windows clients. Keyfile's Keyfile offering supports OS/2, Windows and DOS servers but only Windows and DOS clients.

There may be several key platform considerations beyond the hardware operating system. For instance, support for an existing NOS, such as NetWare, may heavily influence the imaging system decision, especially if the imaging server runs as a NetWare Loadable Module or is incorporated directly into NetWare (see stories, this page).

DATABASE PLATFORMS

The type of database supported can be just as influential. Although many imaging vendors have proprietary databases, the current trend is toward supporting popular third-party SQL databases.

"The proprietary database, optimized for image handling and retrieval, may be of some benefit in terms of performance," says Gartner Group's Popkin. "However, most customers already have one or more SQL databases. They want to tie into those."

The SQL databases tend to be highly scalable; some, like Oracle Corp.'s Oracle, run on everything from PCs to mainframes. The SQL approach also makes it much easier for existing applications developed to work with those databases to access images, and it opens the door to new database applications that can easily encompass images.

Many vendors support just one or two standard databases. However, some vendors offer support for a wider range of databases. For instance, DG supports databases made by Oracle, Sybase, Inc., Informix Software, Inc. and Ingres. IdentiTech and Lanier Worldwide, Inc. support Oracle, Sybase, Gupta Corp. and Microsoft databases, while Optika supports Sybase, Gupta and Microsoft databases.

WINDOWS SUPPORT

Just as some companies or work groups heavily favor a particular third-party database, some are strongly Windows-oriented on the client side. For such customers, the Windows capabilities of the imaging system will be a prime consideration.

Strong Windows support is reflected in products that implement such Windows standards as Dynamic Data Exchange and Object Linking and Embedding (see story, page 47). It is also indicated by support for Windows' emerging Open Database Connectivity (ODBC).

ODBC makes it possible to access multiple databases from a single Windows client or a single database from a variety of clients.

With ODBC, developers can write applications that convert proprietary database calls into standard ODBC calls. Then the target DBMS translates those standard ODBC calls into its own calls. Thus, any ODBC-compatible client can access any ODBC-compatible database.

IBM, ImageFast Software Systems, Inc., LaserData, Metafile Information Systems, Inc., Pinnacle Micro and Simplify Development Corp. currently support ODBC.

Sigma Imaging Systems, Inc. and Teamworks have announced ODBC support. However, even some heavily Windows-oriented vendors, such as Optika, have not yet announced support for it.

Image-enabling NetWare

Novell, Inc. NetWare users seeking an imaging system may want to keep close track of how vendors intend to support Novell's Image and Document Management Services (IDMS) — formerly Image-Enabled NetWare. IDMS is imaging infrastructure software created for Novell by Imagery Software, Inc. a subsidiary of Eastman Kodak Co.

The as yet unreleased IDMS will provide imaging services and application program interfaces (API) on NetWare 4.0 file servers. In other words, imaging services could optionally be integrated directly into the network operating system (NOS).

Major IDMS-related modules include: NetWare 4.0's High Capacity Storage System; the Mass Storage Service, which provides global file migration services; the Document Management Service, an API for desktop objects such as folders, documents and workbaskets; and the Image Management Service, for creating and accessing image files.

Using IDMS, users should be able to create rich, tightly integrated multivendor imaging systems. Developers and users alike should enjoy shorter product development and enhancement cycles in the context of the relatively mature, stable and widely supported NetWare NOS.

All this focus on platforms should not obscure the fact that the imaging application has needs of its own that may or may not match the preferred platforms.

For production-oriented applications involving millions of documents, consider the imaging vendors with a good track record in Unix, such as FileNet or ViewStar. These vendors have more experience in these types of applications, and their products have the features — particularly work flow — that these applications demand. And they utilize Unix, which provides the type of multitasking and high-powered processing that imaging applications require.

Unix servers also scale up better than PCs and are more economical than mainframes.

FileNet and ViewStar may have higher price tags, but they may prove cost-effective in the long run by providing the most efficient and flexible processing platform for complex, high-volume applications.

NT may eventually prove a viable alternative to Unix for these types of applications, but it's still too soon to say.

LaserData will support NT-based jukebox, database and print service in the first quarter. Many other vendors plan to support NT but don't have an announced time frame.

For a single-server imaging network, users that surpass 10 million total stored document images on-line or 10,000 pages a day saved are often better off with Unix because of its proven benefits. Unix is also often the right choice well below those levels. High retrieval volume may also make a Unix system more attractive.

Unix users tend to concentrate imaging activity in a minimum number of servers — often, just one — preferring more powerful hardware rather than more servers. This approach is often less expensive and almost always easier to administer and manage.

NetWare-oriented users can employ a similar strategy by implementing imaging applica-

But IDMS is currently almost a year late. Some observers are also worried about its performance and capacity limitations. However, even the worriers believe that IDMS will be a vital platform, perhaps after some initial stumbling.

"IDMS is extremely important," says David Wood, vice president of new business development with Law Cypress Distribution Co., a San Jose, Calif.-based value-added distributor specializing in imaging. "Anyone who ignores that does so at their own risk."

Imaging vendors that say they will support IDMS as soon as it comes out include IDAS Corp., Optika Imaging Systems, Inc., Simplify Development Corp. and TechKNOWLOGY Acquisition, Inc. Those saying they will support IDMS soon after it is released include Compulink Management Center, Inc., Teamworks Technologies, Inc. and Winthrop Stewart Associates, Inc.

IDAS has announced a new version of its product, IDAS 4.0, specifically tailored to the IDMS platform. IDAS 4.0 will be available before the end of 1993, the company says.

Other imaging companies have not announced whether or when they will support IDMS.

BY MICHAEL HURWICZ

tions on superservers, such as those from NetFRAME Systems, Inc.

Customers that wish to remain on PC server platforms can address capacity problems by distributing loads to multiple servers, each with its own storage subsystem. This is most desirable when the application is naturally distributed.

Windows NT plans

► ImageFast Software Systems, Inc. and Teamworks Technologies, Inc. will use Microsoft Corp.'s Windows NT to support:

- Client workstations
- Optical jukebox servers
- Database servers

► Imara Research Corp. will use Windows NT as a database server only.

► Lanier Worldwide, Inc. will initially use Windows NT to support clients, and in the second quarter of 1994, the company will use it as an optical jukebox server.

► LaserData, Inc. will use Windows NT in the first quarter of 1994 to support:

- Print servers
- Optical jukebox servers
- Database servers

Many other imaging systems vendors plan to support Windows NT but have not announced a time frame.

For example, certain work groups may be the primary users of certain images; storing those images locally to those work groups will minimize network traffic.

Response time may also improve because several optical jukeboxes or drives can usually respond to multiple simultaneous requests faster than a single optical drive can. In addition, smaller optical disks provide better response time.

However, it is easier to manage one centralized, unified image storage system. To attain that, users may still want to implement a single Unix server or superserver and cache images

Continued on page 54

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to local work group magnetic storage.

Caching refers to temporarily copying requested data to a faster or more readily accessible storage area. In the imaging arena, this typically means from optical to magnetic media. This copying slightly slows the first access. However, it greatly improves speed on subsequent accesses.

Users can get the best of both worlds by having a centralized and distributed server net, even if it is a more expensive setup. Not all vendors support this dual approach, however. Some support only Windows-based servers, while others may not support the preferred work group servers, such as NetWare servers.

TRICKS OF THE TRADE

Independent of whether users decide on a central or distributed image storage approach, there are some tricks that can be employed in order to improve performance.

There is no doubt that image files are large. Even with compression, 50K bytes per page is the industry rule of thumb. Optical storage devices have the capacity to store lots of images, but they are slow compared with the performance that users are familiar with when




using magnetic hard disks.

Large files and slow storage devices would result in abysmal imaging performance on most of today's networks if it were not for caching. Because they must work within the limitations of existing networks and optical storage, all imaging systems can cache from optical to magnetic media.

The ability to implement custom-caching algorithms — which determine how much data is cached for various kinds of files from various storage media — makes the process even more efficient.

Implementing a "least recently used" (LRU) caching algorithm ensures that frequently used images are retained in cache. LRU comes into play when an image in cache must be overwritten to accommodate a more recently accessed image. LRU ensures that the overwritten image is the one that has been unaccessed for the longest time and is, therefore, the least likely to be requested again soon.

However, some vendors go beyond caching information that has been requested. For example, some vendors prefetch images — that is, cache data that has not yet been requested but is likely to be. For instance, when the first page of a multipage document is requested, the

Imaging storage media options		
Media	Best use	Key attributes
 Tape	Off-line storage	<ul style="list-style-type: none"> • Generally used for long-term off-line storage. • Very inexpensive and more reliable than magnetic media, but not as reliable as optical. • Requires tapes to be manually mounted onto drive before images can be accessed. • Once tape is mounted, it usually takes less than a minute for a modern high-speed tape drive, such as a digital audio tape drive, to retrieve an image file.
 Optical	Near-line storage	<ul style="list-style-type: none"> • Generally used for storage of infrequently used images that can be brought on-line quickly. • Less expensive than magnetic media and much more reliable. • Used with a jukebox that automatically mounts optical disk into drive when image is requested. • Can take up to 20 seconds for a jukebox to mount the optical disk.
 Magnetic	On-line storage	<ul style="list-style-type: none"> • Keeps frequently used images mounted on such drives as a server hard disk. • Offers the fastest access time. • More expensive per megabyte, and less reliable than optical or tape storage.

SOURCE: MICHAEL HURWICZ, SEATTLE

system can prefetch subsequent pages, anticipating that the end user will ask for them next.

Staging is another alternative type of caching. Staging also brings documents to faster or more readily accessible storage areas before they are requested, but is based on a knowledge of work patterns.

For instance, if all customers whose names begin with an A are invoiced on the first of the month, image documents related to those customers can be fetched the night before so they will be readily available when work begins. Staging is a work flow-related feature that improves performance.

Generally, high-end systems are more likely to support prefetching and staging. Low-end systems do not usually offer these capabilities. Instead, low-end systems either don't address the issue of imaging's net performance

or do so through distributing functions and segmenting networks, making them less suitable for large, centralized applications.

THE CHANGING LANDSCAPE

Even as vendors continue to pump up work flow and performance enhancing features, they are implementing a number of important changes that will affect the buying decision. For instance, vendors are porting their software to truly open Unix-based systems. While this is a good strategic move for vendors and customers in the long term, the short term can be difficult for both.

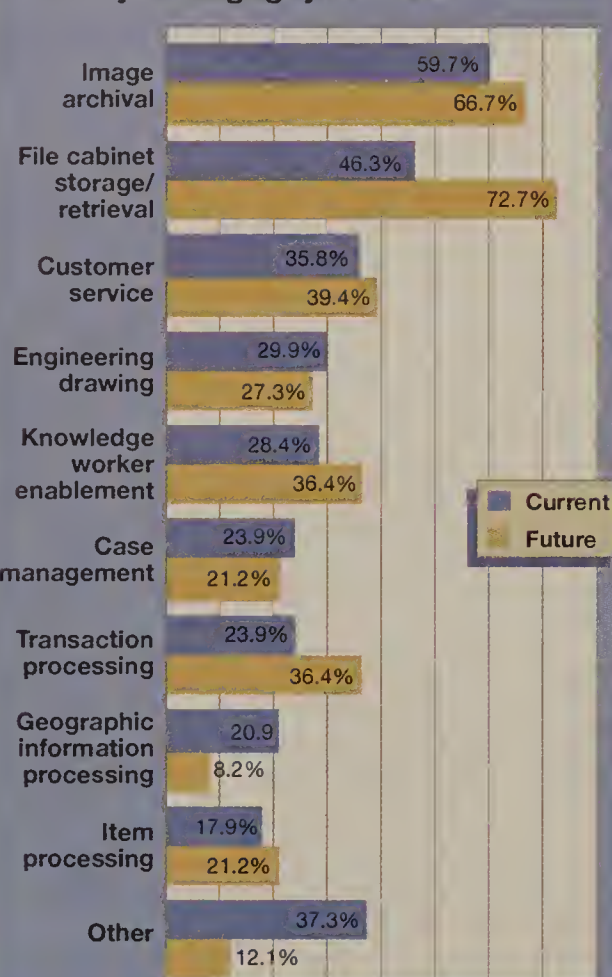
For instance, FileNet's business took a nosedive at the beginning of this year, largely due to a new strategy of putting its software on open Unix platforms from IBM, Hewlett-Pack-

Continued on page 57

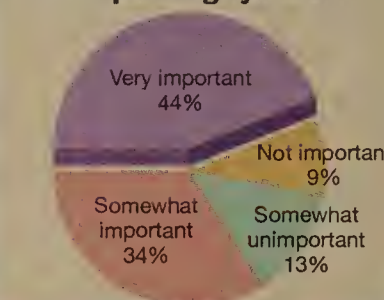
Reader views on imaging systems

Based on 100 interviews

For which of the following applications is your imaging system used?



How important is it that the functionality of imaging systems be built directly into LAN operating systems?



Key service and support issues

Based on highest possible ranking of 3

Free software upgrades	1.31
Ease of installation	1.23
On-site service as part of warranty	1.14
Toll-free hot line	1.09
Next-day availability of parts	.75
Optional on-site service contracts	.36
Other	.06

How would you describe your overall satisfaction with existing imaging systems?



The graphics on this page illustrate key findings of a recent *Network World/Focus Data, Inc.* reader survey on imaging systems. Focus Data, an independent market research firm in Framingham, Mass., conducted the survey and tabulated the results. Focus Data can be reached at (508) 626-2556.

GRAPHIC BY SUSAN SLATER

Imaging systems selection criteria

Based on highest possible score of 10

Criterion	Importance rating	Satisfaction rating
Service/support	8.73	7.44
Ease of use	8.40	6.94
Conformance to standards	8.07	7.14
Throughput/performance	7.90	6.71
Works with other types of client applications	7.78	6.37
Price	7.37	5.77
Works with third-party DBMSs	6.99	7.39
Works with third-party development tools	6.52	5.98

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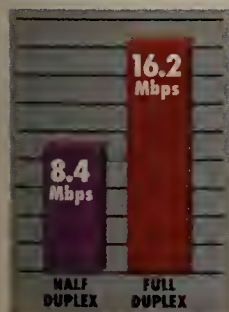


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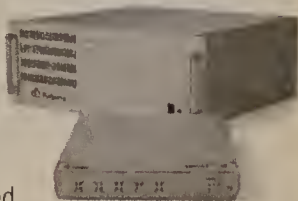
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Imaging systems

Company	Product	Operating system support C = Client; S = Server							Windows support	LAN type	Imaging formats	Work flow support		Database features							Development environment	Distributed capabilities	Price
		DOS	Macintosh	NetWare	OS/2	Windows	Windows NT	Unix	Other					P = Proprietary T = Third party	Max. index fields	Prefetching	Least recently used caching	User-configurable caching	Batch scanning	COLD	Print by reference		
Bull Worldwide Information Systems (508) 294-6000	ImageWorks					C		S		A, B	L, N, T	P, T	A		✓	✓	✓	✓	✓	✓		A, B, C	F: \$38,302 A: \$300,000/20
Compulink Management Center, Inc. (310) 212-5465	LaserFiche Windows/NLM	C, S		S							N	T			✓	✓	✓	✓	✓	✓		A, C	F: \$7,995 A: NA/5
	LaserFiche LAN	C, S									N, V	T	A		✓	✓	✓	✓	✓	✓	O	A, B, C	F: \$4,995 A: NA/5
Data General Corp. (800) 328-2436	AV Image					C		S		A	N, T	P, T			✓	✓	✓	✓	✓	✓		A, C	F: \$4,950 A: \$25,000/5
FileNet Corp. (800) 345-3638	WorkFlo Business System	C				C		C, S		A, B, C	L, N, T, V	J (1), P, T	A		✓	✓	✓	✓	✓	✓	P, V	A, B, C	F: \$215,000 A: \$250,000/64
FileTek, Inc. (301) 251-0600	Storage Machine	C	C		C	C		C, S			N, T				✓	✓	✓	✓	✓	✓		B	F: NA A: \$669,000/ No limit
4i Solutions, Inc. (800) 228-1416	4Fase	C, S		S							N	P, T	A		✓	✓	✓	✓	✓	✓	O	A, B, C	F: \$17,100 A: NA
	4Most					C, S				E	L, N, T, V, O	T	A		✓	✓	✓	✓	✓	✓		A, B, C	F: \$2,000 A: NA
IBM (203) 973-7766	ImagePlus Workfolder Application Facility/400	C			C	C		S		A, B, E	O	J	A		✓	✓	✓	✓	✓	✓	P, O	A, B, C	F: \$48,200 A: \$100,000/10
	IBM SAA ImagePlus Folder Application Facility MVS/ESA				C, S	C		S			N	J	A		✓	✓	✓	✓	✓	✓		A, B, C	F: \$800,000 A: \$2,400,000/200
	IBM SAA ImagePlus/2				C, S						O	J, P, T	A		✓	✓	✓	✓	✓	✓		A, B, C	F: \$4,500 A: \$6,000/5
	IBM Image and Records Management				C, S						L, N	T	C		✓	✓	✓	✓	✓	✓	O	A, B, C	F: NA A: \$300,000/25
IDAS Corp. (714) 553-1904	Image Data Authoring System 2.0	C									N	T	C		✓	✓	✓	✓	✓	✓		A, C	F: \$3,095 A: \$8,100/5
IdentiTech, Inc. (407) 951-9503	FYI	C, S				C, S				A, B	N	J, P, T	A		✓	✓	✓	✓	✓	✓	P, V	A, B, C	F: \$300,000 A: \$800,000/250
ImageFast Software Systems, Inc. (800) 899-6665	ImageFast	C, S				C, S				A, B, E	L, N, T, V	J (1), P, T	A		✓	✓	✓	✓	✓	✓	V	A, C	F: \$5,880 A: NA/5
ImageTech Corp. (313) 353-7900	Papergate			S		C				A, B	L, N, V	P, T	C		✓	✓	✓	✓	✓	✓	V, O	A, C	F: NA A: \$10,500/5
Image-X Enterprises (805) 964-3535	IMAGEmate	C, S				C, S		C, S		A, B	N	T	B		✓	✓	✓	✓	✓	✓	V	A, B, C	F: \$6,400 A: \$25,000/1
Imara Research Corp. (416) 581-1740	Imara				C, S	C				A	L, N, V	P, T	C			✓	✓	✓	✓	✓	V, O	A	F: \$38,000 A: \$70,000/25
Keyfile Corp. (603) 883-3800	Keyfile	C, S			C	C, S				A, B, C	L, N, V	T	A		✓	✓	✓	✓	✓	✓	P, V	A, B, C	F: \$9,000 A: NA/5
Lanier Worldwide, Inc. (800) 708-7088	Lanier IMS Online				C, S	C, S				A, B	L, N, T, V, O	P, T			✓	✓	✓	✓	✓	✓	P, V	A, C	F: NA A: \$92,000/50
LaserData, Inc. (508) 649-4600	DocuData			S		C				A, B, E	N	T	C		✓	✓	✓	✓	✓	✓	P, V	A, B, C	F: \$75,000 A: \$250,000/50
Lotus Development Corp. (617) 577-8500	Lotus Notes: Document Imaging				S	C				A, B, C	L, N, V, O	J, P, T	B		✓	✓	✓	✓	✓	✓		A, B	F: NA A: \$295/1
Metafile Information Systems, Inc. (800) 638-2445	Metaview for DOS	C, S						S			N, V	T (3)	A			✓	✓	✓	✓	✓	O	A, B, C	F: \$15,180 A: NA/3
	Metaview Folders	C, S			C, S	C, S				A, C, D, E	L, N, V	J, P, T (4)	A		✓	✓	✓	✓	✓	✓	V	A, B, C	F: \$18,170 A: NA/3
Micro Dynamics, Ltd. (301) 589-6300	Micro Dynamics MARS		C, S			C		C			L, N, T, V	J, T	C			✓	✓	✓	✓	✓	O	A, C	F: \$16,995 A: \$70,000/4
NCR Corp. (519) 884-1710	Document Management System	C				C		C, S		A, B, C, D	L, T	T	A		✓	✓	✓	✓	✓	✓		A, B, C	F: \$160,000 A: \$320,000/20
Optika Imaging Systems, Inc. (719) 548-9800	FilePower/PowerFlow	C, S		S	S	C, S		S		A, B	L, N, T, V	P, T	A		✓	✓	✓	✓	✓	✓		A, C	F: NA A: \$1,000/1
PaperClip Imaging Software, Inc. (201) 487-3503	PaperClip — Network Edition	C, S		S		C, S					L, N, V, O	T	A		✓	✓	✓	✓	✓	✓		A, B, C	F: NA A: \$30,000/20
Pinnacle Micro, Inc. (800) 553-7070	Paperless One		C, S			C, S				E	L, N, V, O	T	A					✓	✓			A, C	F: NA A: \$6,995/No limit
Recognition International, Inc. (formerly Plexus Software, Inc.) (800) 999-5910	Plexus Extended Data Processing/Plexus FloWare					C		C, S		A, B, C	T	T	C		✓	✓	✓	✓	✓	✓	P, V	A, B, C	F: \$400-\$2,000/seat A: \$100,000/100
Sigma Imaging Systems, Inc. (212) 476-3000	OmniDesk	C			C, S	C				A, B	O	T	A		✓	✓	✓	✓	✓	✓	P, V	A, C	F: NA A: \$7,000/1

Imaging systems

Company	Product	Operating system support C = Client; S = Server								Windows support	LAN type	Imaging formats	Work flow support		Database features								Development environment	Distributed capabilities	Price		
		DOS	Macintosh	NetWare	OS/2	Windows	Windows NT	Unix	Other						P = Proprietary T = Third party	Max. index fields	Prefetching	Least recently used caching	User-configurable caching	Batch scanning	COLD	Print by reference				A = AppWare P = PowerBuilder V = Visual BASIC O = Other	
		A = DDE client B = DDE server C = OLE 1.0	D = OLE 2.0 E = ODBC	L = LAN Manager N = NetWare T = TCP/IP	V = VINES O = Other	J = JPEG P = PCX T = TIFF	A = Vendor-supplied module B = E-mail-based C = Third party	GUI-based	Staging																		
Simplify Development Corp. (603) 881-4450	MailRoom for Windows/Share-Scan			S		C			A, E	N	P (1), T	B	✓	✓	P	3		✓		✓				P	A, C	F: \$2,585 A: \$5,000/20	
SodaCreek Technologies (408) 438-3530	SCT*Image	C, S	C		C	C, S		C, S	C, S	A, B, E	L, N, T, V	P, T			P, T	(9)	✓			✓		✓		P, V	A, B, C	F: NA A: \$50,000-\$75,000/5	
Teamworks Technologies, Inc. (508) 460-0053	PaperBridge for Access	C, S				C, S				A, B, E	L, N, T, V	P, T (1)	C		✓			✓		✓	✓	✓	✓	V, O	A, B, C	F: \$990 A: NA/5	
	Frequent Filer	C, S			S		S	S			L, N, T, V	P (1), T			T	50	✓	✓		✓		✓			A, B, C	F: \$7,000 A: NA/5	
TechKNOWLOGY Acquisition, Inc. (800) 264-0713	TechKNOWLOGY Imaging Software for Windows					C, S				A	N	P, T	A		✓	P	10	✓	✓	✓	✓	✓	✓	V, O	A, C	F: \$15,000 A: \$56,000/25	
ViewStar Corp. (510) 865-7827	ViewStar	C, S			S	C, S		S		A, B	L, N, V	J (1), P (1), T	A		✓	✓	T	No limit		✓	✓	✓	✓	✓	P, V	A, B, C	F: NA A: \$350,000-\$400,000/75
Wang Laboratories, Inc. (508) 459-5000	OpenImage for NetWare	C, S				C		C, S		A, B	N	J, P, T	C		✓	✓	T	65,000	✓		✓	✓		✓	P, V	A, B, C	F: \$11,210 A: NA/8
	OpenImage for AIX/UX	C, S				C		C, S		A, B	O	J, P, T	C		✓	✓	T	65,000	✓		✓	✓		✓	P, V	A, B, C	F: \$37,000 A: NA/8
Westbrook Technologies, Inc. (203) 399-7111	File Magic Plus for Workgroups	C, S				C, S				B	L, N, V, O	J, P, T	C			P	20				✓			A, P, V, O	A, C	F: \$2,495 A: \$25,000/10	
Winthrop Stewart Associates, Inc. (617) 331-8325	Kwic Systems	C, S				C, S		S		A, B	L, N, T, V (10)	J (1), P (1), T	B		✓	P	No limit	✓			✓	✓		P, V	A, B, C	F: NA A: \$50,000/25	

Products highlighted by color were selected for The Short List.

- FOOTNOTES:
(1) Supports import only.
(2) Max. index fields is Oracle Corp.'s maximum.
(3) Supports TIFF through software conversion.
(4) Supports export only.
(5) 100 per document class.

- (6) 18 subfolders.
(7) Number of index fields is user-definable.
(8) Max. index fields is application-dependent.
(9) Limited only by database used.
(10) All NOSes redirected except NetWare.

COLD = Computer Output to Laser Disk
DDE = Dynamic Data Exchange
GUI = Graphical user interface
JPEG = Joint Photographic Expert Group
NA = Not applicable

NLM = NetWare Loadable Module
NOS = Network operating system
OCR = Optical character recognition
ODBC = Open Database Connectivity
OLE = Object Linking and Embedding
TIFF = Tagged Image File Format

SOURCE: MICHAEL HURWICZ, SEATTLE

Continued from page 54

ard Co. and Sun, says Pam Bliss, senior analyst for document imaging service at Dataquest, Inc., a market research firm in San Jose.

"Customers were waiting to see how that went before they bought," Bliss says. "They knew they didn't want to buy the closed version. But they didn't want to be the first ones on the new platforms, either."

There will also be a rapid growth in imaging on PC local-area networks as lower prices entice small offices and departments into imaging. However, these users often find more complexity than was promised on the shrink-wrapped package.

"You bring it home, you load it on your PC," Bliss says. "Your hard disk fills up after about 10 images. Now you need some kind of optical storage. Then you want to start sharing, so you bring it up on the network. Now other issues emerge having to do with the capacity of the network in the small office environment."

An increase in modularization and vendor specialization will also affect the future purchase decision. "There is a growing recognition that imaging and work flow are two separate technologies," says Gartner Group's Popkin. "You can buy them together, or you can just buy good image management and buy work flow separately."

With all these changes in the wind, users need to make sure the product they select today can either be totally replaced or easily upgraded in the next few years.



The Short List: Imaging

The Short List highlights products Network World recommends you examine during the purchasing process for imaging systems. Products included in The Short List meet the buying criteria outlined here and, in some cases, offer additional useful features. Those criteria reflect the needs of users with multivendor enterprise networks. Your criteria may differ based on network configuration and application needs.

■ **Compulink Management Center, Inc.'s LaserFiche Windows/NLM** offers improved performance, reliability and security in Novell, Inc.'s NetWare environments by running as a NetWare Loadable Module (NLM). It manages image databases using Btrieve, another well-established Novell standard that works with popular Novell and third-party tools. As a local-area network product, LaserFiche Windows/NLM costs a fraction of more functional Unix-based systems but is feature-rich for its class. For instance, it supports batch scanning, Computer Output to Laser Disk (COLD), prefetching and some distributed capabilities. For instance, the database scanning and optical character recognition (OCR) functions can be on separate servers. However, multiple databases cannot be searched with a single query. The product's Windows support is not particularly strong at this time. For example, there is currently no support for either Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE). However, DDE support has been announced.

■ **Recognition International, Inc.'s Plexus Extended Data Processing/Plexus FloWare** runs on a wide range of Unix-based servers, including those supplied by IBM, Hewlett-Packard Co., Sun Microsystems, Inc., NCR Corp., Digital Equipment Corp., Data Gen-

eral Corp., Amdahl Corp., Pyramid Technology Corp., Sequent Computer Systems, Inc. and Tandem Computers, Inc. Despite its Unix server focus, the product goes beyond the minimum in supporting Windows clients by offering DDE client and server functionality as well as support for OLE 1.0, with OLE 2.0 coming at a later date. Likewise, the product is open enough to support a third-party supplied work flow component and such third-party application development tools as Microsoft Corp.'s Visual Basic and Power Corp.'s PowerBuilder.

The product supports a highly distributed architecture that enables multiple database servers, scanning and OCR stations to function as a single, unified system. It also supports a range of caching features, including prefetching, a least recently used algorithm and user-configurable caching algorithms. It is also rich in other features and functions, such as batch scanning, COLD and print by reference.

■ **Simplify Development Corp.'s MailRoom for Windows/ShareScan** is described as an "image document builder" that integrates the functions of other products to form an imaging system. For instance, Simplify's software integrates with work flow, OCR, facsimile and document management software provided by other vendors. Scanning is provided by Simplify's own ShareScan. By integrating other vendors' software, MailRoom for Windows/ShareScan is well-suited to support enterprise imaging, where images are made available to existing applications.

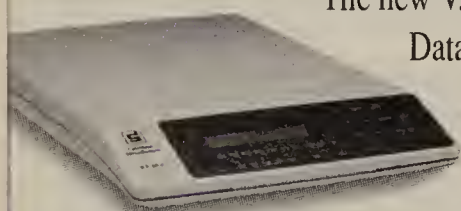
For instance, the MailRoom for Windows component of the product can be used with the electronic mail and work flow features of such popular software as Lotus Development Corp.'s cc:Mail, Beyond, Inc.'s BeyondMail, WordPerfect Corp.'s WordPerfect Office and Microsoft Corp.'s MS-Mail. It also works with OCR products from Caere Corp., Calera Systems, ExperVision and Xerox Imaging Systems; fax products from Delrina Technology, Inc., Alcom Corp., Optus Software, Inc., and Intel Corp.; document management products from PC DOCS, Inc., SoftSolutions Technology Corp. and Saros; and optical storage solutions from Conner, Inc., Novell, Inc., Cheyenne Software, Inc. and Palindrome Corp.

♦ Hurwicz is a free-lance writer and LAN consultant based in the Seattle area and can be reached by AT&T Mail at !mhurwicz@attmail.

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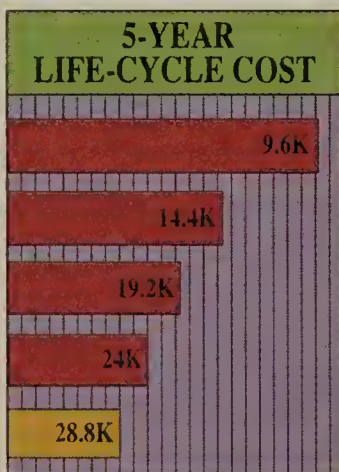
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Help desk

Continued from page 2

user in a large organization is approximately \$300 per year. And, depending on the number of messages a user sends, the actual cost per message can be just pennies. It is so low, that most organizations consider it a free service.

So where does the true cost of E-mail come from? The costs within each one of these categories can vary widely according to what E-mail product or products you are using and what operating system is underneath it all. For example, an E-mail product that integrates closely with the network operating system and requires little user training across all types of users in a company will cost significantly less

than a nonintegrated, overly complex system.

Another interesting conclusion from the studies is that the actual purchase price of the E-mail package per user is the least significant factor — the largest cost factors are administrative maintainance and user training.

Carefully choosing your E-mail package with these results in mind can create significant savings. As with most network products, the only way you'll find what fits your needs is by trying different E-mail packages before you purchase one. Don't worry about network costs unless your current system is overburdened. E-mail generally requires little in the way of network resources.

Finally, it is useful to consider how E-mail will generate cost savings. Studies have shown that when considering all the costs and over-

head involved, a four-page document costs more than \$3 to send via postal mail, nearly \$10 via facsimile and even more by overnight courier. Compare that to just pennies for E-mail. As an organization starts replacing other methods with E-mail, the cost question becomes irrelevant compared to the savings.

Network World contacted Creative Networks and found that users can purchase a copy of its study, "Messaging Systems: The True Cost of Ownership," for \$995 by calling (415) 326-9926. Users can also call Ferris Networks at (415) 986-1414 to purchase the back issue of its monthly newsletter, the Ferris E-mail Analyzer, titled "Figuring the Cost of PC E-mail" for \$60 or buy a copy of its report, "Integration of PC E-mail: Planning, Product Evaluation and Implementation" for \$655. ☐

Unifi

Continued from page 29

D channel of the BRI link.

Manager software runs on a separate Unix workstation and enables net managers to monitor, manage and reroute calls.

Client software runs on Unix-based agent workstations outfitted with ISDN BRI interfaces and a Windows 3.0 graphical user interface. The workstations can receive calls over a BRI line's 64K bit/sec B channel and get cus-

tomer profiles from remote hosts over the 16K bit/sec D signaling channel.

The first PhoneServer application, Distributed Call Center, is software that runs on the PhoneServer Controller and enables users to create distributed call centers.

The Controller determines where each incoming call should be sent. If necessary, it issues a D channel message invoking an ISDN supplementary service that tells the central office switch to reroute the call to another location.

Supplementary services, which include

hold, transfer and drop, are supported by central office switch software.

The Controller also sends a message to the receiving agent workstation telling it that a call is on the way. It then establishes a session with either a local or remote host computer instructing it where to send the customer profile data. The profile is downloaded from the host into the ISDN net using an X.25 link and is then passed to the agent's terminal with the voice call over a BRI link.

The Controller maintains the real-time status of each agent on the distributed net. ☐

LEGENT

Continued from page 19

NetWare 3.X and Windows NT Advanced Server networks next year.

"This is what I call a high-risk, high-reward system," said Glen McDermed, program director of large computer strategies with consultancy Gartner Group, Inc. in Stamford, Conn.

The reward from ESM is that it allows enterprise backup to be completed at LAN performance speeds while simultaneously providing a disaster recovery option at the mainframe.

The risk lies in the complexity LEGENT built into the product, McDermed said.

"With such a complex scheme, [there are] several places where things can go wrong," he said. Changing the configuration of even a single server would require extensive testing to

ensure that the move would not disrupt the entire backup process, he added.

"ESM does have many moving parts and is highly distributed," said Tom Bernhardt, a technology analyst with Star Enterprise, a division of Texaco Corp. in Houston. But in the four months that Star Enterprise has been a beta site for ESM, the company has not run into any management problems, thanks largely to the ASO component, he added.

"Not only does this component automatically complete all the backup processes based on the policies set by an administrator, but it also handles the processing distribution and control," Bernhardt said. He added that if a server or another part of the system goes down, ASO will automatically switch the processing duties of the downed component to another active one.

While Star Enterprise has only run the beta version of ESM on six LAN servers backed up

by Texaco's central IBM 3090 mainframe — all of which are in Houston — the company is planning to implement ESM companywide on its 30 local servers and 24 remote servers.

According to Carrai, EMS is the first deliverable in the distributed backup and recovery functional area of LEGENT's Cross Platform Environment (XPE). This XPE initiative is the company's recently announced client/server systems management architecture. In addition to backup and recovery, XPE comprises seven other areas of systems management. Those areas include distribution management, software administration, network problem management, resource management, distributed operations management and user administration.

ESM pricing starts at \$30,000 and is based on the number of LANs and amount of storage associated with each.

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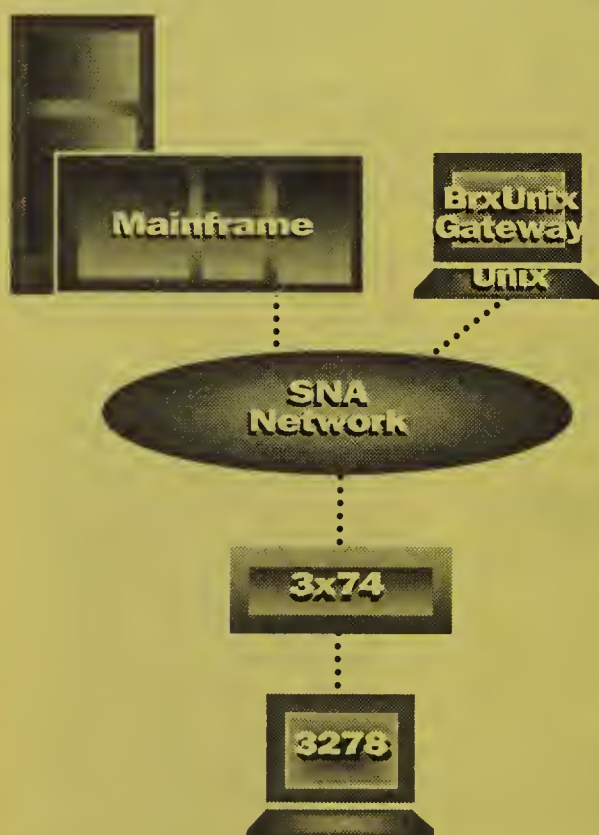
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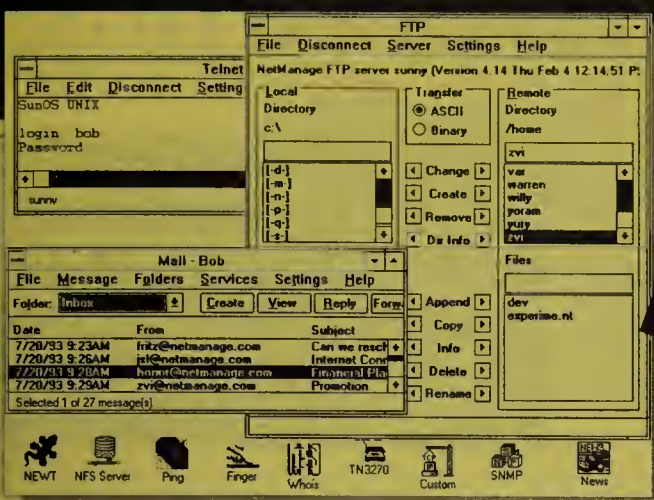
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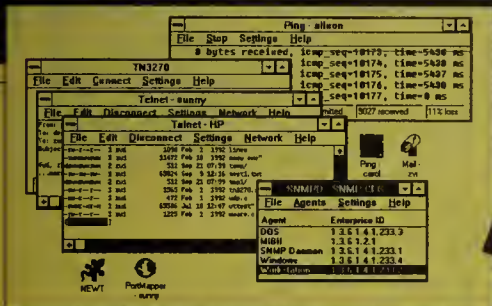
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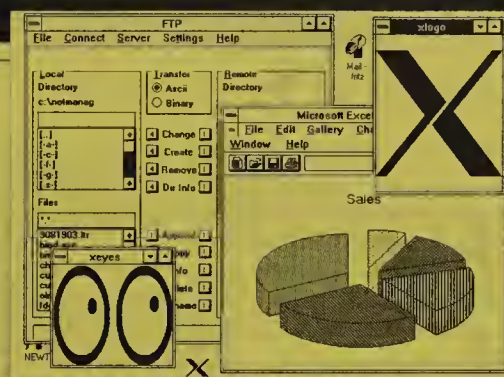
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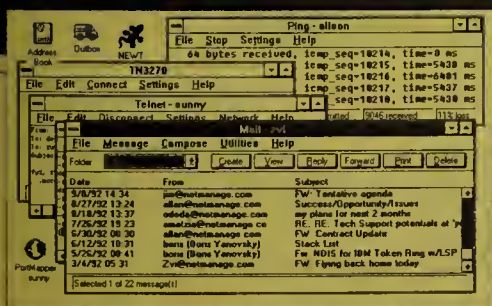
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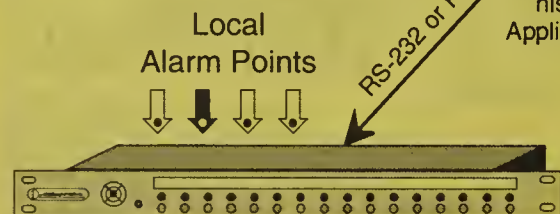
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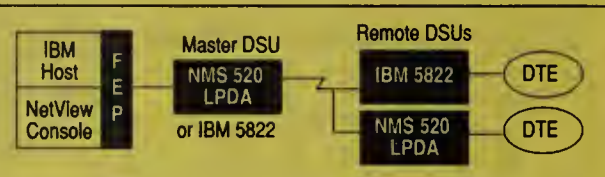
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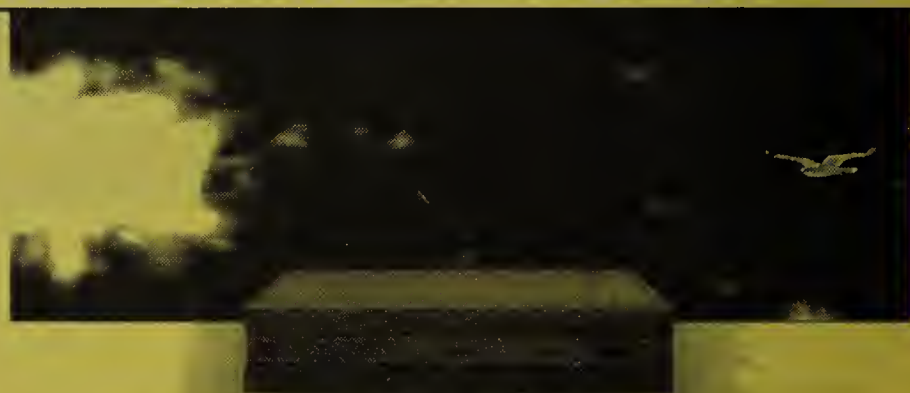
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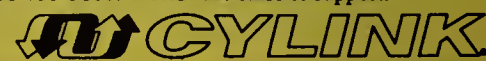


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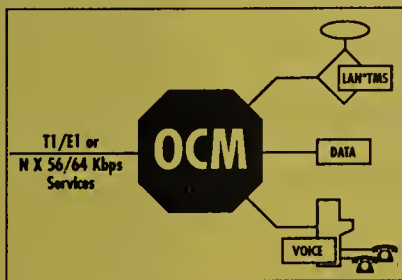
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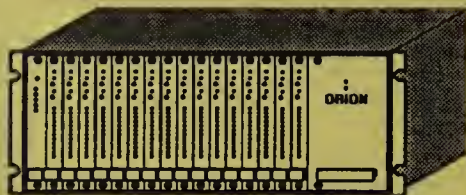
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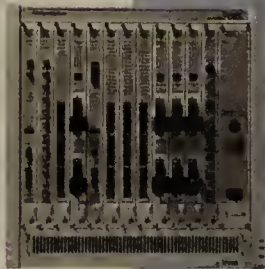
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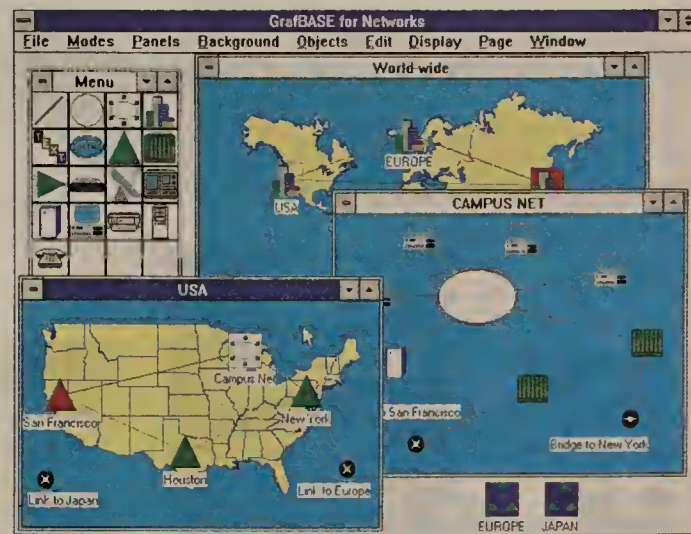
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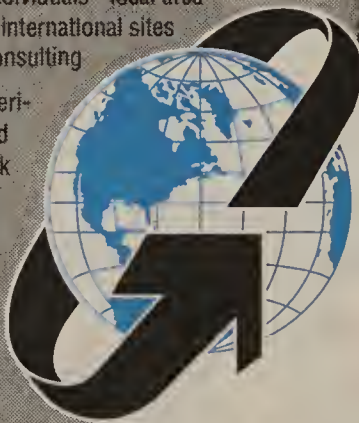
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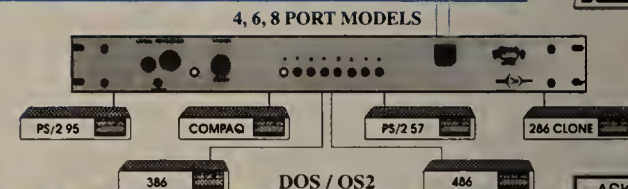
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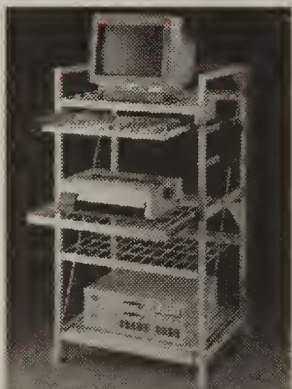
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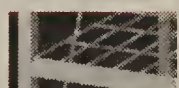
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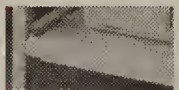
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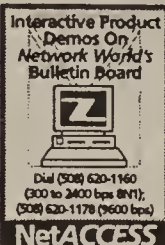
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Applicants should send their resumes to Professor Charles E. Smith, Search Committee Chair, Department of Electrical Engineering, University of Mississippi, University, MS 38677, by January 31, 1994. The University is prepared to fill this position as soon as possible, but it will remain open until filled. Starting date no later than August 1, 1994. Inquiries can be directed to Professor Smith at (601)232-7231.

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based processor that supports four RMON agents.

RMON is an extension of the SNMP Management Information Base (MIB) II that provides a standard method for tracking, storing and analyzing network management data for remote devices.

The agents, which support all nine Ethernet RMON groups and nine of the 10 token-ring RMON groups, provide a range of traffic statis-

tics and analysis information for any device connected to the Infinity (see graphic, this page). The tenth token-ring RMON group will be added in the first quarter of 1994.

The Infinity could already provide SNMP MIB II management data to attached third-party SNMP management platforms. Terry Gaston, vice president of marketing at ODS, said the addition of RMON support will let the hub collect detailed management data down to the desktop level and pass it to the SNMP management platform to help users identify trouble spots and plan for future upgrades.

"The Infinity, which was essentially a

desktop connectivity device when it debuted, needed more management intelligence in order to become a hub of hubs," he said.

The RMON-enabled management module will be available this month and comes in two versions.

The \$7,500 model allows the user to manage any module or device connected to any two of the hub's four backplanes. A second \$9,950 version can be used to manage all four of the backplanes.

Existing SNMP-based management modules for the Infinity can be upgraded with the RMON capabilities via software free of charge.

SWITCH AWAY

The new Ethernet per-port switching modules ODS will unveil with its RMON capabilities include the 1094-SBTFL, which comes with four 10Base-FL ports and 12 10Base-T connections; the 1094-SFL12, which has 12 10Base-FL ports; and the 1094-SBT12, which has 12 10Base-T ports.

This switching capability complements existing per-port configuration switching for token-ring environments. It will ease management of moves, adds and changes by allowing users to be assigned to any segment regardless of location as well as eliminating the need to visit wiring closets to make the change.

Per-port switching lets net administrators load-balance on-the-fly, utilizing bandwidth more efficiently, and increase overall net performance.

"By connecting an Ethernet work group or departmental hub to one of these modules, net managers can effectively turn that segment into a virtual work group that can be switched among the multiple backplanes," Gaston said. "An enterprise hub connected to one of the switched ports can even be treated as a work group segment and moved around as needed."

The next challenge facing ODS is integrating LAN switching into the Infinity's architecture, Pigg said. ODS offers modules from Kalpana, Inc. and Artel Communications Corp. that provide dedicated 10M bit/sec Ethernet links to the desktop, but that capability needs to be extended across the hub's backplanes, according to Pigg.

"Eventually they will either have to acquire the technology or develop it themselves and tightly integrate it into the hub's architecture," she said. "The technology is too strategic to rely on OEM agreements."

The 10Base-T module costs \$5,400, while the fiber-based model is tagged at \$6,400. The combined 10Base-T/fiber module costs \$7,800. All three will be available early in the first quarter of 1994.

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Deciphering RMON

The 9 standard groups of the Remote Monitoring (RMON) Management Information Base:

Statistics

Provides real-time packet distribution and error counters for 5 different types of packets, including undersized, oversized, fragmented, jabbers and cyclic redundancy check/alignment errors.

History

Provides a historical view and trend analysis of data gathered in Statistics group.

Host Table

Supplies end-node traffic statistics, including number of broadcasts, multicasts, and good and bad packets sent and received.

Host Top N

Extends Host Table by providing sorted host statistics, such as the top 10 busiest nodes or all nodes that have sent bad packets within a certain time period.

Traffic matrix

Indicates the amount of traffic and number of errors between 2 nodes.

Alarm

Sets thresholds to generate traps according to user-defined parameters.

Filter

Generic filter engine that starts packet capture functions and events.

Packet capture

Lets users create multiple capture buffers, enabled by criteria set in the Filter group.

Event

Allows users to log events and send alarms to the management station, triggered by user-defined events.

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Continued from page 1

NetSP is a three-tiered program that resides on client nodes, application servers and a designated authentication server.

In its first release, NetSP supports DOS, OS/2 and AIX/6000 clients, as well as OS/2 and AIX/6000 servers on Network Basic I/O System, LU 6.2 or Transmission Control Protocol/Internet Protocol-based environments. The program is built on the Internet Engineering Task Force's Generic Security Services Application Programming Interface (GSSAPI), which defines a common way for third-party applications to work with security software.

NetSP is invoked when the client workstation requests access to an application on a server anywhere in the enterprise. The request is shuttled through a designated NetSP authentication server, which maintains a database of user passwords, IDs and information on access rights.

After confirming the user's identity and access rights, the authentication server issues a "key," or password substitute, to NetSP on the application server, which opens up the requested application.

If the user needs access to another

nection. Again, the authentication server issues a secure password key to the mainframe and gains access to the application.

Analysts said the IBM program begins to address some of the security problems facing users building enterprise networks.

"Managing the security of these distributed networks is a real [pain] for users," said Winn Schwartz, executive director of Inter.Pact, a security consulting firm and publisher of the Security Insider Report newsletter based in Seminole, Fla.

"It's up to individual users whether they want security based on a mainframe or on a server," Schwartz said. "In the distributed world, a server is probably the answer, but mainframes will continue to be part of that environment."

Schwartz said one of the keys for IBM and other vendors trying to address distributed net security is to make sure all security tools work as one. Since NetSP employs the industry standard GSSAPI, IBM's Vijay said he expects other vendors will adopt the same standard in the future.

Advantis, a value-added network services provider based in Schaumburg, Ill., is comfortable with RACF, but has been beta-testing NetSP and is looking to move some security functions off the mainframe and onto RISC System/6000 workstations.

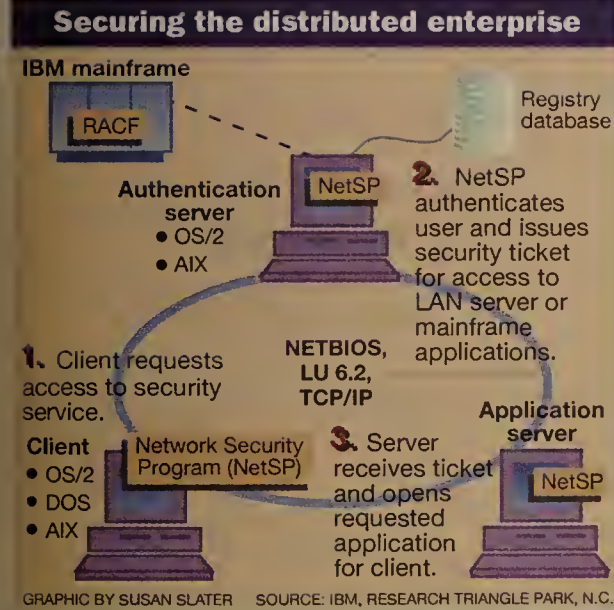
"NetSP would let our security people isolate functions on a single workstation that they could lock in a vault and easily control access to," said David Gowdy, an advisory analyst with Advantis.

Gowdy said his experience so far with NetSP has been favorable. "We liked it because it brought a generic set of functions to the table that could protect distributed resources and at the same time work with our existing RACF security on the mainframe."

NetSP will be available Jan. 25, 1994, in a 50-user version for a monthly license fee of \$292 or a onetime charge of \$7,008.

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"In the distributed world, a server is probably the answer, but mainframes will continue to be part of that environment."



application, the authentication server can grant access without going through the initial sign-on and password routine.

"It will give [users] a single logon to multiple applications and give security officers a generic way to authenticate users and their access to distributed applications," Ahuja said. "It also keeps the user's password and ID from being broadcast across the net, where anyone could grab it."

Another key feature to NetSP is that it allows user access to applications under IBM's existing MVS and VM mainframe-based Resource Access Control Facility (RACF). RACF controls Systems Network Architecture security.

Clients needing access to an SNA 3270 application on a mainframe make the request via their authentication server and it makes the connection with RACF on the mainframe. NetSP is not required on the mainframe for this con-

SynOptics

Continued from page 1

chronous Data Link Control conversion products and BlueVision, which integrates management of SNA and LAN nets. It is expected to roll out a controller module for its hubs by the second half of 1994 and, sources said, the module will be codeveloped by IBM.

"In order to deliver the network fabric that can support the application requirements for enterprise environments, we need to support legacy applications and devices," said David Brenner, SNA product manager at SynOptics.

SynOptics' 3174 Workstation Controller, which was codeveloped and manufactured by IBM, will occupy one slot in the 3000 and enable the hub to support as many as 32 direct-attached 3270 terminals. Users on token-ring nets supported by the hub can also access host applications by using the module to connect to a front-end processor (FEP).

APPN Network Node routing code is included with the module, enabling users to embrace the distributed SNA model — IBM's so-called Networking Blueprint — and run peer-to-peer applications such as those based on IBM's Advanced Peer-to-Peer Communications. The module also offers dependent logical unit requestor support, which allows legacy 3270 applications to run in distributed environments.

The module is conformant to IBM's SystemView architecture and can be managed from the SNA side via IBM's NetView management system. Support for the Simple Network Management Protocol also allows it to be managed by SynOptics' new 4.0 version of Optivity for NetView/6000.

That new version also supports the recently announced LattisSystem 5000 intelligent hub and allows users to create and manage virtual token-rings. Net administrators can assign users to any token-ring segment regardless of geographic location, meaning users not physically connected to each other appear to be on the same net.

The company will also unveil enhanced RouterMan and PathMan LattisWare Solution applications for NetView/6000. RouterMan, which aids in managing routers, will get support for IBM's 6611 router. PathMan, which enables an administrator to trace packets across a network, will be upgraded with SNA device support, allowing net managers to track a token-ring frame as it travels from a LAN to a FEP.

John McConnell, president of McConnell

Redirects

Continued from page 1

an upgrade of the basic operating system only and should not be confused with Cairo, Microsoft's object-oriented operating system expected to ship by mid-1995.

Adam Waalkes, manager of the developer relations group for Windows NT, said the Daytona effort focuses on size and performance issues. "We're working to make Windows NT run faster on smaller machines," Waalkes said.

Analysts agree that a lack of NetWare connectivity and high memory requirements may have deterred potential NT users. "Until something concrete comes out that links Windows NT users up to NetWare, a lot of its desirability as a client or server platform will be missing," said Deborah Hess, senior analyst at Datapro Information Services Group in Delran, N.J.

Johnson said the decision to build a gateway to NetWare services was driven by beta users.

The software includes support for NWLink, a transport protocol compatible with NetWare's native Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) protocol. Remote access services included in Windows NTAS give remote Windows NT clients the same level of access.

Johnson said the gateway redirector could theoretically support an unlimited number of clients, but Microsoft is now conducting stress tests on the gateway to determine a practical limit.

The gateway software will also let Windows NT clients access 16-bit NetWare-based utilities such as syscomm, pconsole and userlist and 16-bit applications, written to Novell-specific application program interfaces.

Jodi Mardesich, an analyst with the Salt Lake City-based consultancy The Burton Group said

using a gateway to access a NetWare server might cause a decrease in performance. "When you think of gateways, you think of delays and implementation headaches," she said.

Johnson said she does not expect decreased performance because the gateway supports a packet burst facility that allows large packets to pass through quickly.

Sources at Novell said the company's NT client software, which has been in a limited beta release since last fall, will be generally available early next year and offers all of the services proposed by Microsoft.

The Novell client software is also expected to support a single logon to a Windows NTAS server and a NetWare server simultaneously. NT workstations running Novell client software will also have access to NetWare 4.X global directory services.

©Microsoft: (800) 426-9400.

NA product scorecard

Offerings currently available or announced by the top 3 hub makers

CABLETRON

- SNA Network Access Controller Media Interface Module — Converts SDLC traffic into token ring- and Ethernet-compatible formats.
- Spectrum Management Module for IBM Token-Ring bridges
- BlueVision — Provides interface between IBM's NetView and Cabletron's Spectrum net management platforms.
- Spectrum for IBM AIX NetView/6000 — Allows Cabletron products to be managed from NetView/6000.
- 3270 Emulation
- Advanced Peer-to-Peer Networking (APPN) Network Node
- APPN End Node
- Data Link Switching

CHIPCOM

- Online 3174 Establishment Controller Module for Online Systems Concentrator hub
- IBM Hub Management Program — Lets users manage Chipcom devices from NetView/6000.

SYNOPTICS

- 3174 Workstation Controller Module for LattisSystem 3000 hub
- SNMP Transport Gateway Module — Encapsulates SNMP data in LU 6.2 for transport over SNA backbone.
- LattisEngine/486 Module — NetWare for SAA server
- Optivity for NetView/6000 net management package
- LattisWare Solution applications, including RouterMan, PathMan and TokenRing BridgeMan

GRAPHIC BY SUSAN J. CHAMPENY

Consulting, Inc. in Boulder, Colo., said integrated management functionality could be the key differentiator in the near future. "If you want to play at the enterprise level, you need to bring highly integrated management tools to the game," he said. "SynOptics made a big step in that direction with the LattisWare upgrades and the ability to create virtual token rings."

SynOptics' 3174 Workstation Controller module will be available in the second quarter of 1994 and cost \$11,995. Optivity for NetView/6000 4.0 will be available in the first quarter for \$5,995.

©SynOptics: (408) 988-2400.

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Having trouble with a product or service? Call NW's Reader Advocacy Force Hotline at (800) 622-1108, Ext. 487, or access the R.A.F. Forum on our BBS (see page 2). On the Internet? Contact nwraf@world.std.com.

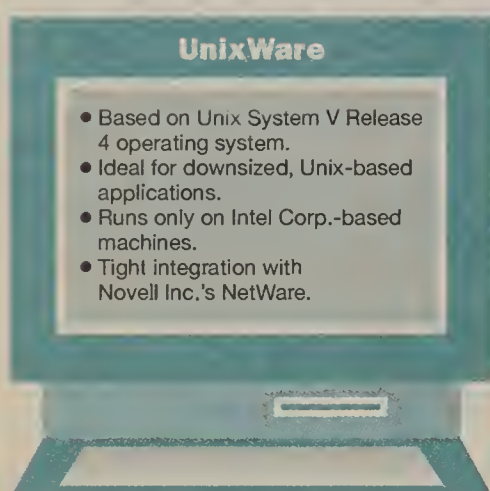
Server

Continued from page 1

sing capabilities, Microsoft's NTAS offers a user-friendly, scalable platform for both high- and low-end applications.

A determining factor in which product will win the application server fight lies in the availability of applications. UnixWare supports any Unix System V Release 4 (SVR4)-based application, including many mission-critical business applications, both homegrown and off-the-shelf.

Windows NTAS, on the other hand, can support the vast number of existing Windows applications, but it will take time before developers produce applications designed to take advantage of its multiprocessing capabilities and other features.



OS/2 was first shipped three years ago, giving application developers adequate time to build on top of it. The most recent IBM OS/2 application guide listed 1,196 OS/2 applications ranging from traditional business applications such as word processing and spreadsheet programs to advanced distributed databases.

"You can't say that any one of these systems is inappropriate as an application server for any given application because each holds its own benefits and trade-offs," said Mark Gibbs, a consultant with Gibbs and Co. based in Ventura, Calif. "You, as a user, have to pick the operating system that fits into your target environment."

There are two ways to define an application server. The first is as a high-end server used to run downsized mission-critical applications on a local-area network.

In this case, an end user accesses the application through a personal computer or workstation, but it is executed at the server. This application server requires adequate power from the operating system to handle the processor-intensive applications.

The second type of application server is one used as a central repository for low-end business applications, such as spreadsheet or word processing programs. In this case, the server downloads the application over the LAN to a workstation, where the processing is completed. An operating system fitting this bill needs to provide as much processing power on the desktop as it provides at the server level.

THE POWER OF UNIX

Novell has positioned UnixWare to fall under the first definition of an application server. Biff Traber, UnixWare product marketing director at Novell, said his product's strength lies in its ties to the powerful Unix operating system and its integration with existing NetWare networks.

In addition to being able to run any Unix SVR4 application, UnixWare supports NetWare's basic transport protocol, Internet Packet Exchange/Sequence Packet Exchange (IPX/SPX), giving NetWare clients easy access to Unix applications running on the server. Conversely, application developers can write programs that access files residing on a traditional NetWare file server.

John Faig, senior research analyst with META Group in Westport, Conn., said UnixWare gives user a "turnkey box" they can plug into their NetWare networks. "Even if that plug-and-play box only contains a decent operating system, Novell is going to have a great sales advantage over its competitors because of the huge NetWare install base," he said.

UnixWare does not currently support symmetric multiprocessing (SMP), which is a function that spreads the processing tasks of high-end applications over multiple processors in a LAN server.

However, in the first half of next year, Traber said Novell is planning to add SMP support, which will allow UnixWare to run on extremely high-end servers containing as many as 30 processors.

NT AIMS FOR SCALABILITY

While Novell has just begun making UnixWare a scalable platform, Microsoft has built Windows NTAS on that premise. NT and its server version, NTAS, can run on both multiprocessor Intel machines and scale up to higher-end RISC-based servers.

"Scalability is important because if you deploy a solution based on NTAS and you run out of hardware power, you don't need to change your operating system to move to machines with more power," said Tom Johnston, product manager for NT.

While upgrading to more powerful hardware platforms and higher end applications remains an option, users of NT and NTAS said the combination right now just provides quick and easy access to applications.

Randy Dugger, workstation manager at Tandem Computers, Inc. in Cupertino, Calif., uses NT on 30 departmental PCs, which access Microsoft's WordPerfect and Word for Windows residing on a single NTAS application server.

"I base my purchase decisions on currency," Dugger said. "If multiple users can launch application software [stored in] a central place, I buy five copies instead of 20, and that saves money."



Analysts agree that NT is likely to remain in the second category of application repositories for some time.

"NT is a good platform, but it will take a while before people will want to take the chance of running their mission-critical applications on a new operating system,"

said Marty Palka, an analyst with Dataquest, Inc. in San Jose, Calif.

Paul Cabbage, also an analyst with Dataquest, agreed. "This is less a question of technology and more of winning the minds and hearts of the people. It takes three years to make an operating system really good. I don't think NT will shorten that."

THE QUIET CONTENDER

While Microsoft was busy pushing its new operating system, IBM was even busier selling its old one, according to one application developer whose company manufactures PC-to-Unix connectivity software for both the OS/2 and NT.

"OS/2 is certainly 'en vogue' this year," he said.

Shipments of OS/2 2.0 have passed sales of all previous versions combined. According to International Data Corp., a Framingham, Mass.-based research firm, OS/2 2.0 has an installed base of 3.9 million end users and is expected to get close to five million by year's end. While there are certainly far more copies of Windows and Unix in use, OS/2's growing popularity has nonetheless forced users to take a second look at implementing it on the application server level.

Jeff Lyons, design systems engineer at the weigh/wrap engineering division of PMI Food Equipment in Troy, Ohio, said that after evaluating NT, his company decided to stay with OS/2 because it's a better developed, more stable environment.



"OS/2 is getting a lot of second and third looks today. It has a lot of neat things to offer," he said. Specifically, Lyons lauded OS/2's multitasking capabilities that enable it to execute several program functions concurrently. While he has not yet tested UnixWare, Lyons said he has looked at NT as an application server but decided on OS/2 because it is a more stable environment.

Marc Roberts, a program manager for OS/2 at IBM, said IBM first positioned OS/2 to go on the desktop because it offered good processing power with a fairly low memory requirement — a minimum of 4M bytes, although IBM recommends 8M bytes.

"We can't deny that OS/2 got into accounts on the desktop. But then customers realized that OS/2 is really a stable, multitasking system that could run things like databases," Roberts said.

Since OS/2 is a 32-bit operating system at both the workstation and the server level, developers can use the same set of application program interfaces to write to both the server and the workstation environments.

"As an application server, I wouldn't go with either [NT or UnixWare], I'd go with OS/2," said Stan Greene, national sales manager at Data Connections, a reseller based in Simi Valley, Calif. ☐

WordPerfect's Office suite gets wireless support

BY ADAM GAFFIN

Provo, Utah

WordPerfect Corp. this week is expected to announce wireless support for remote users of its WordPerfect Office suite of programs.

The firm will announce a deal with RAM Mobile Data USA, Ltd. that allows WordPerfect Office Remote software users with an Intel Corp. wireless modem to access WordPerfect Office on a host or local-area network over RAM Mobile's national wireless data net. WordPerfect Office users can access mailboxes from Windows and DOS remote clients, with a Macintosh version expected early next year.

The company has already announced support for remote users with standard modems. A spokesman said the company will look at adding support for other wireless systems in the future but has no immediate plans for any additional wireless releases.

WordPerfect Office Remote has the same features as WordPerfect Office, including electronic mail, calendaring and database functions. Users can exchange messages and synchronize their remote in- and out-boxes and calendars with their mailbox on the LAN. Users can also filter incoming messages based on priority, message type, and message and attachment size.

The firm expects to add support by mid-1994 for a WordPerfect hub at MCI Communications Corp. that will connect WordPerfect Office users without having to install WordPerfect's asynchronous gateway.

The remote software will be bundled with WordPerfect Office software, which costs \$495 for a five-user license.

©WordPerfect: (800) 861-2507.

NETWORK WORLD

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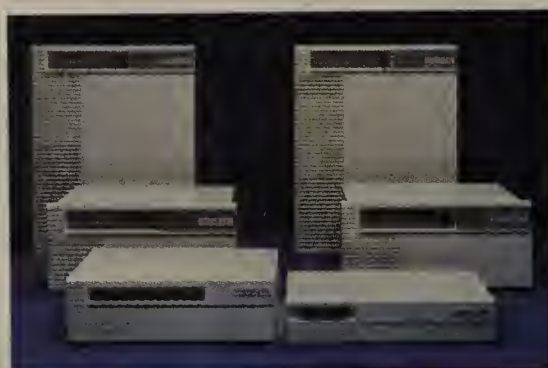
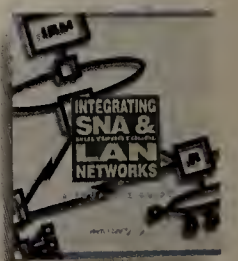


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